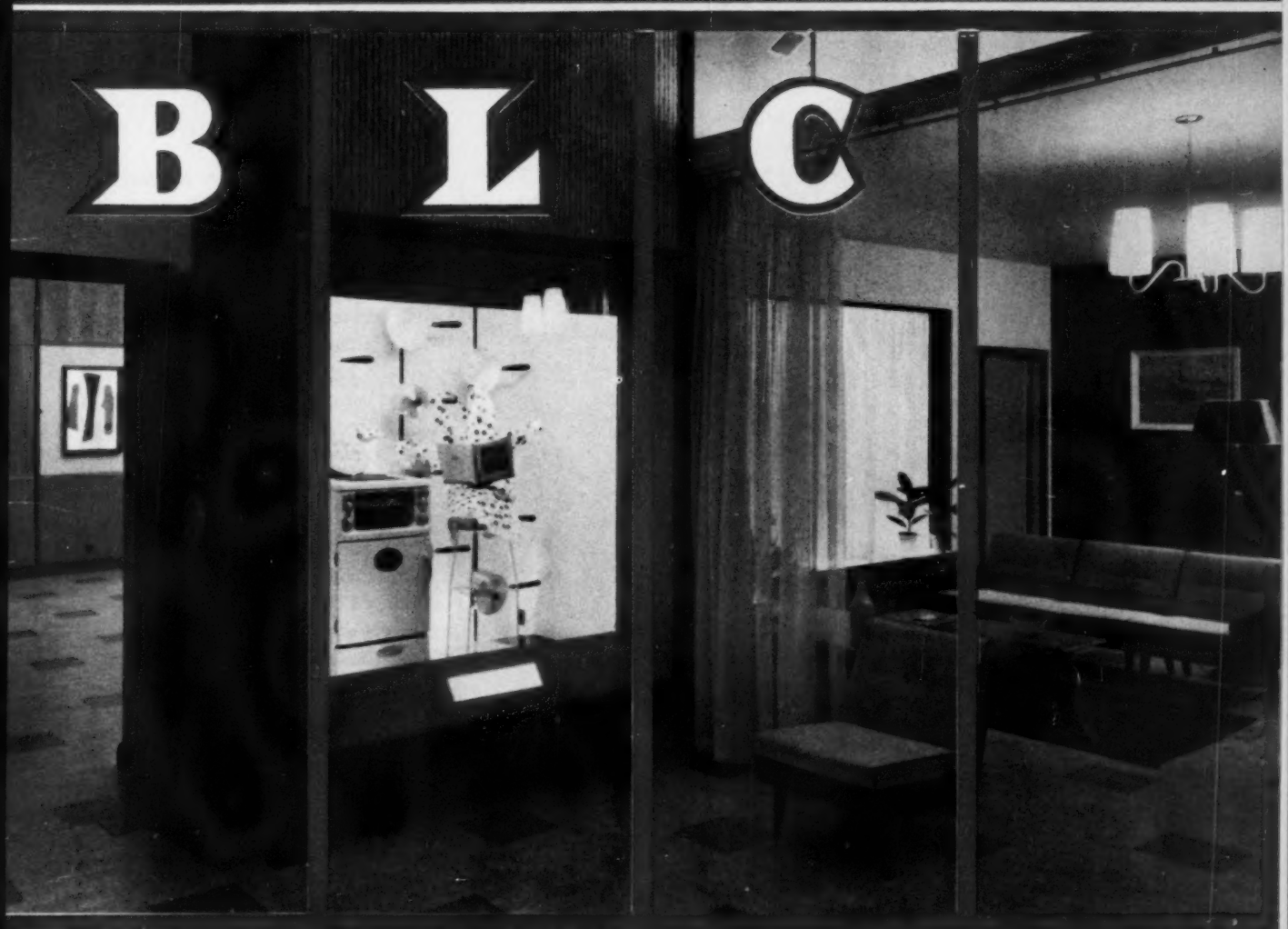
Light and LIGHTING

APRIL, 1959 PRICE 3s. 6d



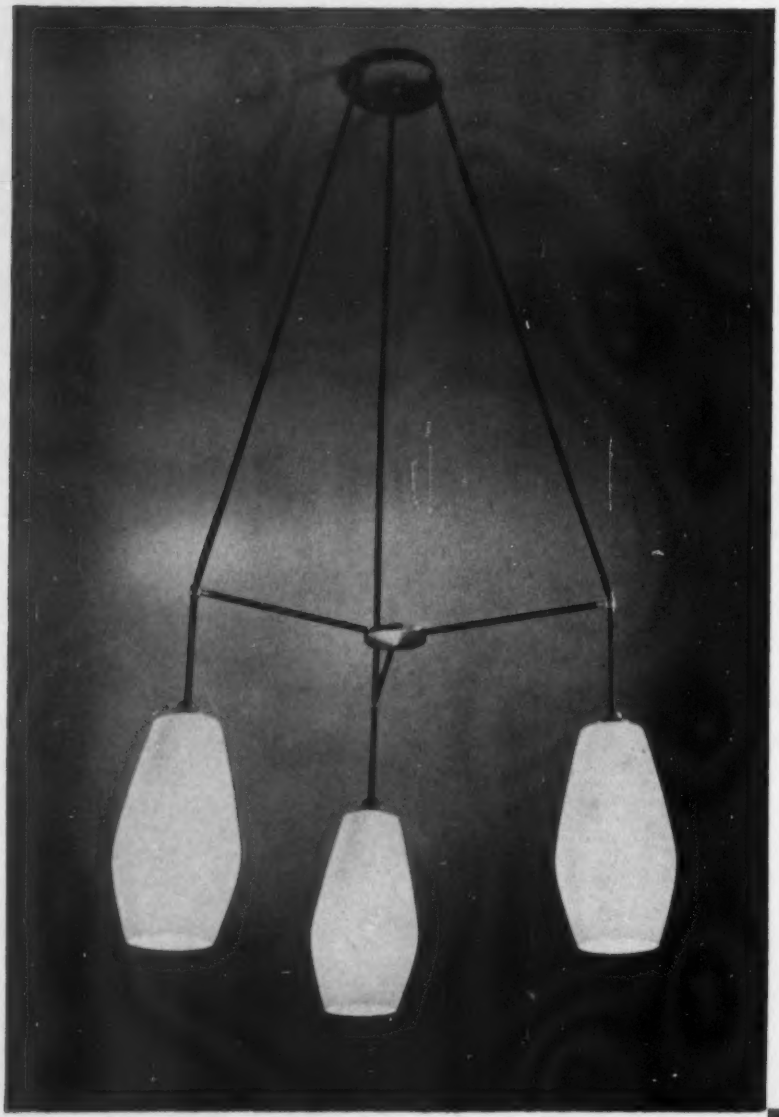
The British Lighting Council has been formed to help all who are in any way concerned with electric lighting. As this illustration shows, its headquarters have been designed to demonstrate as many different aspects of lighting as space will allow.

Left to right: Entrance to conference room lighted mainly by a luminous ceiling with two colours of fluorescent tube on separate dimmers; one of the two demonstration shop windows; a false window for a room with restricted daylight; concealed picture-spotlighting and two of several domestic fittings on view.

The British Lighting Council Ltd., 16-18, Lancaster Place, Strand, London, W.C.2.

Satina fittings

win a Design Centre 1958 award



Extract from the judges' comments, published in *Design*

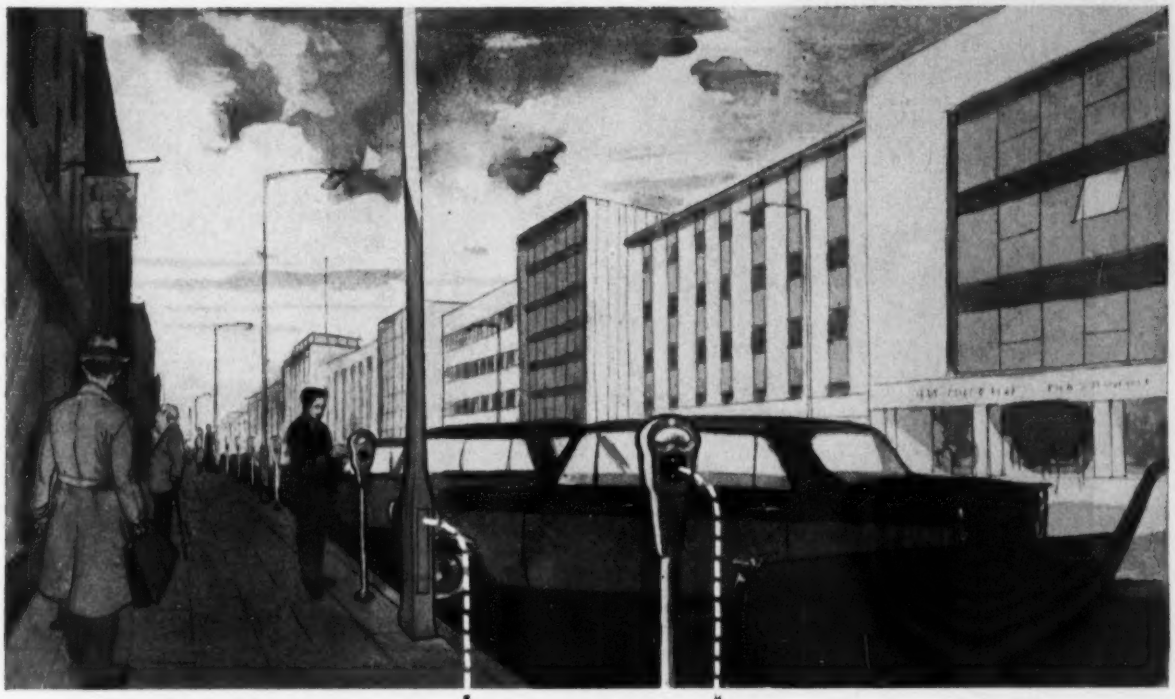
'The judges have chosen this range of pendant fittings and this particular shade (though others almost as good are available in the range) for these fine points—the quality of the satin-finished opal glassware, which is attractive both lit and unlit; the delicacy of the bracket arms; the unostentatious use of brass in combination with black rods; and the general elegance of the range in all sizes.'

The Satina range of fittings, like all A.E.I. lighting equipment, was developed by the company's design staff in collaboration with a leading industrial design consultant.

A·E·I
Lamp and Lighting Co Ltd

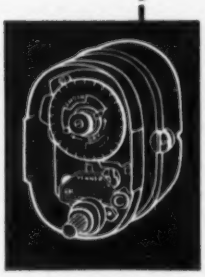
ILLUMINATING ENGINEERING SOCIETY

Head Office,
Melton Road, Leicester. M4788A



streets ahead!

The Venner Type MSQP Time Switch has small over all dimensions and a large dial for easy setting. It can be supplied in a die cast aluminium box or a plastic box with transparent cover.



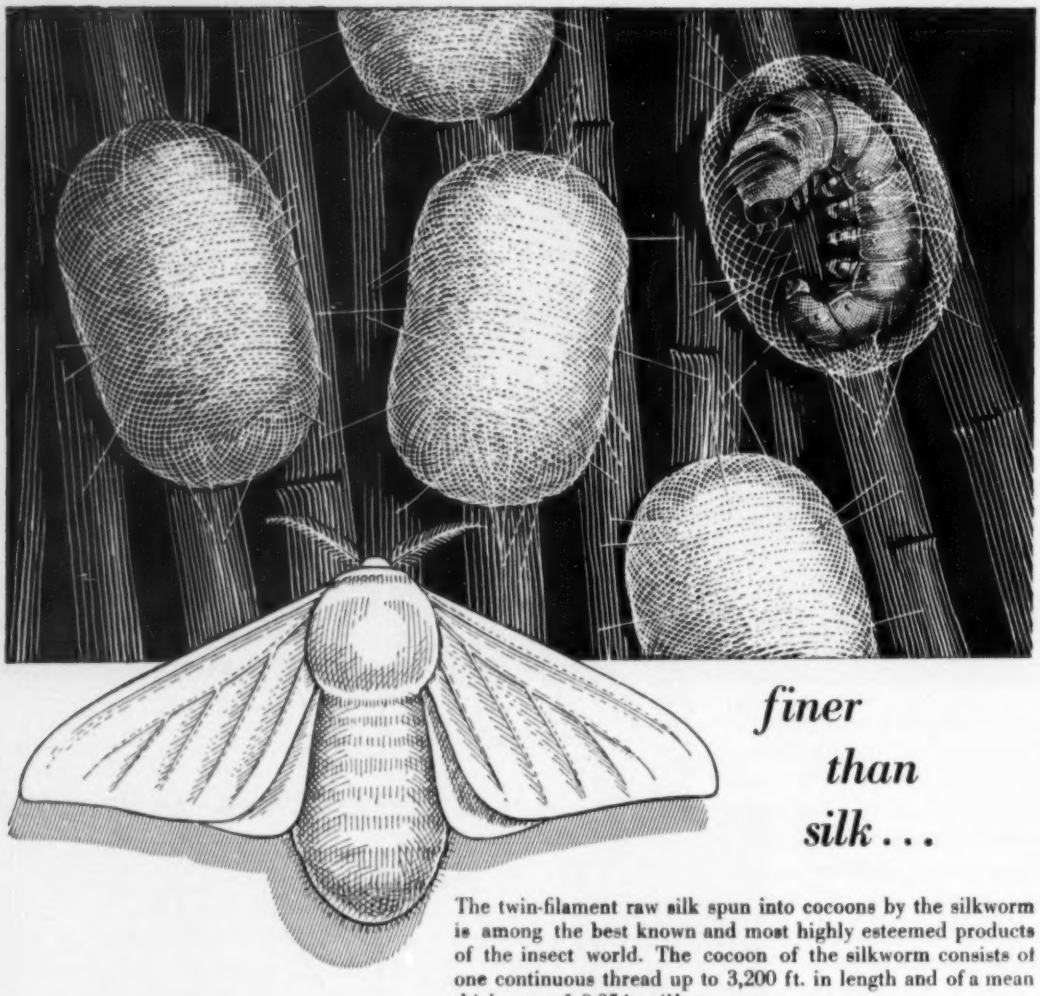
Behind the street scenes of today Venner control equipment is playing an increasingly important part. For years *Venner Time Switches* have led the field in the automatic control of street lighting. Now *Venner Park-O-Meters* are accepted as the most satisfactory solution of the toughest of all traffic problems. You are invited to send for full details.

The Venner automatic Park-O-Meter, as already installed in Mayfair, is theft-proof, tamper-proof and weather-proof. It has been acclaimed by local authorities, motorists and shopkeepers throughout the world.

VENNER

Park-O-Meters and Time Switches

VENNER LIMITED, Kingston By-Pass, New Malden, Surrey · Telephone: MALden 2442



finer than silk . . .

The twin-filament raw silk spun into cocoons by the silkworm is among the best known and most highly esteemed products of the insect world. The cocoon of the silkworm consists of one continuous thread up to 3,200 ft. in length and of a mean thickness of 0.354 mil!

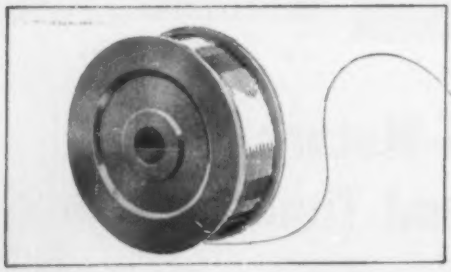
The Luma Works, the largest Scandinavian producers of incandescent and fluorescent lamps, use tungsten and molybdenum wire-drawing machines which are the "silkworms" of modern engineering.

Fine as is natural silk, Luma wire is even finer. The smallest dimension of tungsten wire is 0.197 mil, and every pound of tungsten goes to make 174 miles of wire!

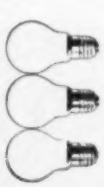
Luma exports 90 per cent of its tungsten and molybdenum wire, and Luma wire is used in radio valves and bulbs in more than 50 countries.

You, too, can get Luma wire in all dimensions and finishes, e. g. black, cleaned or plated, semi-finished rods or finished electrodes.

Write immediately for our new tungsten catalogue in English, French or German.



We manufacture all types of incandescent, mercury vapour, neon and fluorescent lamps, fluorescent fittings and accessories.

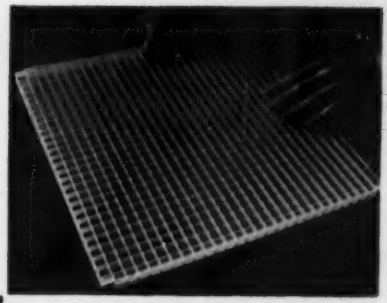


LUMALAMPAN AB

STOCKHOLM 20, SWEDEN
Cables: LUMALAMPAN Stockholm

presenting fashion in a

NEW LIGHT



The flexibility of PARAGRID in commercial and industrial design is evident in the display windows of the Copland & Lye Store in Glasgow where it has been used as an attractive and efficient lighting medium.

•

PARAGRID IS ONE OF MANY HARRIS & SHELDON SYSTEMS WHICH ARE SOLVING EVERY TYPE OF LIGHTING PROBLEM.

•

Complete Lighting Specialists and Manufacturers of Lighting and Control Gear

•

Harris & Sheldon ELECTRICAL **Ltd.**

RYDER STREET, BIRMINGHAM, Central 6272 · 46 GT. MARLBOROUGH STREET, LONDON, W.1. GERrard 0869

DHB/7993

CLEARING

Photograph by courtesy of Ford Motor Company Ltd

LIGHTS WE LIVE BY

Well-lit factories are essential for increased production. Lighting these factories is an achievement of which Revo are proud.
Today, factories, streets, stadiums, schools and public buildings all over the world are lit by Revo. Specialists in solving electrical problems, Revo's fifty years of experience extends over the whole of the electrical field — from industrial lighting to factory switchgear, from electronic equipment to domestic appliances.

Lights we live by . . .

by REVO

By installing these "Duo-Lite" Industrial Reflector Fittings, Revo engineers solved many of the lighting problems of the Ford Motor Company Ltd.

REVO ELECTRIC CO. LIMITED, TIPTON, STAFFS
A Dupont Company
Member of the British Lighting Council

Two important developments

BY

BENJAMIN

MODEL FIFTY RANGE

The 'Model Fifty' range offers all the advantages of the Benjamin 'Saaflux' system, *plus* improved lampholders, reflector beads and dustproof 'Visor' covers.

ONLY FIVE 'SAAFLUX' LAMPHOLDER ASSEMBLIES
to cover all needs in the Tungsten range
(others for Fluorescent Bulb and Mercury Lamps)

Only one BC for all reflector types up to 150W.

Only one ES for all reflector types up to 200W.

Only three GES for all reflector types 300W. to 1500W.

Glassteel diffuser

'R.L.M.' reflector with 'Visor' Cover

Stock Bin unit

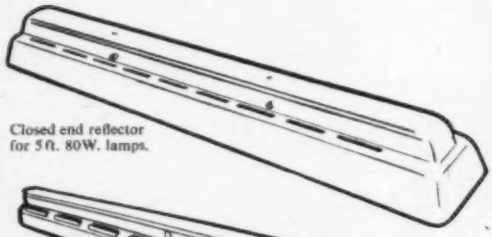
Enclosed Area Floodlight Pole Top.

High Bay reflector

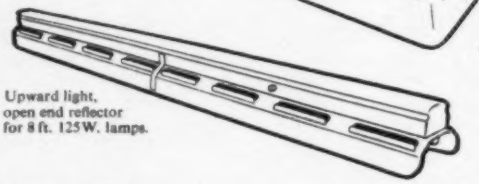
E.D. Dispersive reflector

TASKMASTER 'FLUROLIER' FITTINGS

Taskmaster'—an outstanding range of contemporary fittings finished in the famous Benjamin 'CRYSTEEL' vitreous enamel. New manufacturing methods bring these improved fittings with **one-piece reflector and one-piece channel** into the competitive price field.



Closed end reflector for 5 ft. 80W. lamps.



Upward light, open end reflector for 8 ft. 125W. lamps.

Open end reflector for 5 ft. 80W. lamps.

Acrylic plastic closed top, closed end reflector for 5 ft. 80W. lamps.

Write or telephone NOW for leaflets giving further details.

BETTER LIGHTING BY BENJAMIN

THE BENJAMIN ELECTRIC LIMITED · TOTTENHAM · LONDON N17

Phone: TOTtenham 5252 Grams: Benjalect Southtot London

BIRMINGHAM: 5 Corporation Street *Tel: Midland 5197* · **LEEDS:** 49 Basinghall Street. *Tel: Leeds 23579* · **BRISTOL:** Royal London Building, Baldwin Street. *Tel: Bristol 28406* Smee's 146

Erinoid

LIGHT-STABILISED polystyrene

Since 1955 Erinoid have been supplying light-stabilised polystyrene for the production of lighting fittings. During this period there have been no known cases of failure in service. Accelerated and long-term tests indicate that, on normal indoor use, Erinoid light-stabilised polystyrene does not yellow for at least 3½ years.

Four grades of Erinoid polystyrene have been light-stabilised:

KLP	—general purpose
HS	—heat resistant
2 CL	—high molecular weight
2 CL/HS	—heat resistant high molecular weight

Each of these grades is available in four fully-tested and proved colour formulations:

Crystal clear—1L103
Opal—3L091
3L121*
3L133*

* *light-diffusing*

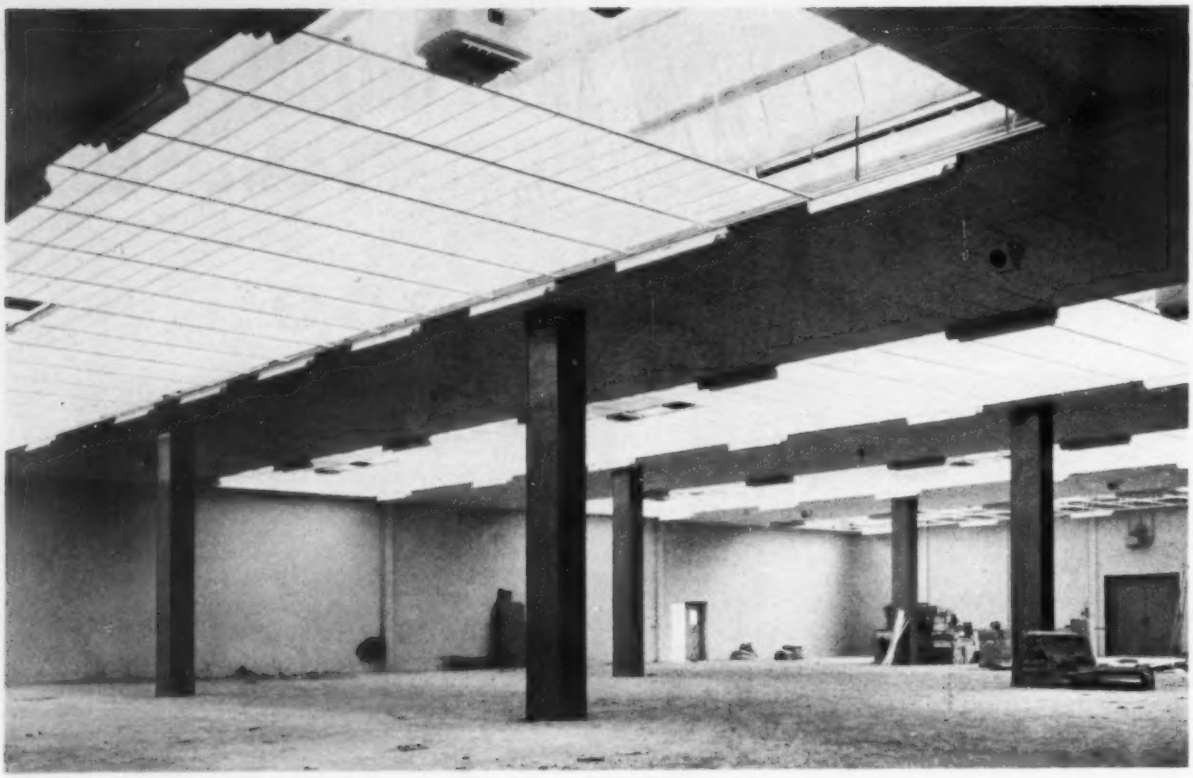
Erinoid *polystyrene is manufactured by*

STYRENE PRODUCTS LIMITED

Full information, samples, prices etc. on application to

ERINOID LIMITED

West Halkin House, West Halkin Street, Belgrave Square, London, S.W.1. Telephone: SLOane 0866



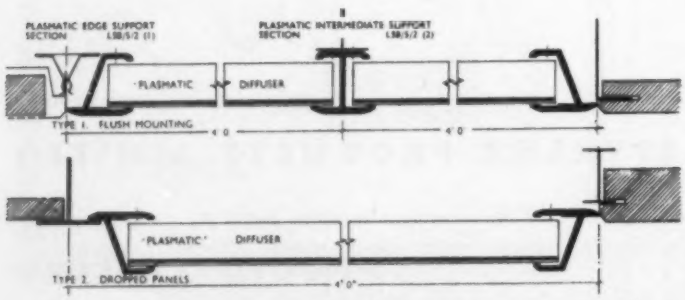
Plasmatic Diffuser panels illustrated above have been installed in the Factory of Ortho—Pharmaceutical Co. Ltd., at Saunderton under the direction of Messrs. Brocklehurst Cooper Williamson, Architects.

plasmatic

PAT. APP. NO. 37491/56 BRIT. DESIGN NO. 882725

diffuser panels for Luminous ceilings

Material: Extruded light stabilised anti-static treated Polystyrene. Light transmission: Opal 54% Pearl 60% Clear 80—90%. Size: 10½ in. wide centres × 4 ft. panels. Weight 10 ozs. per sq. ft.



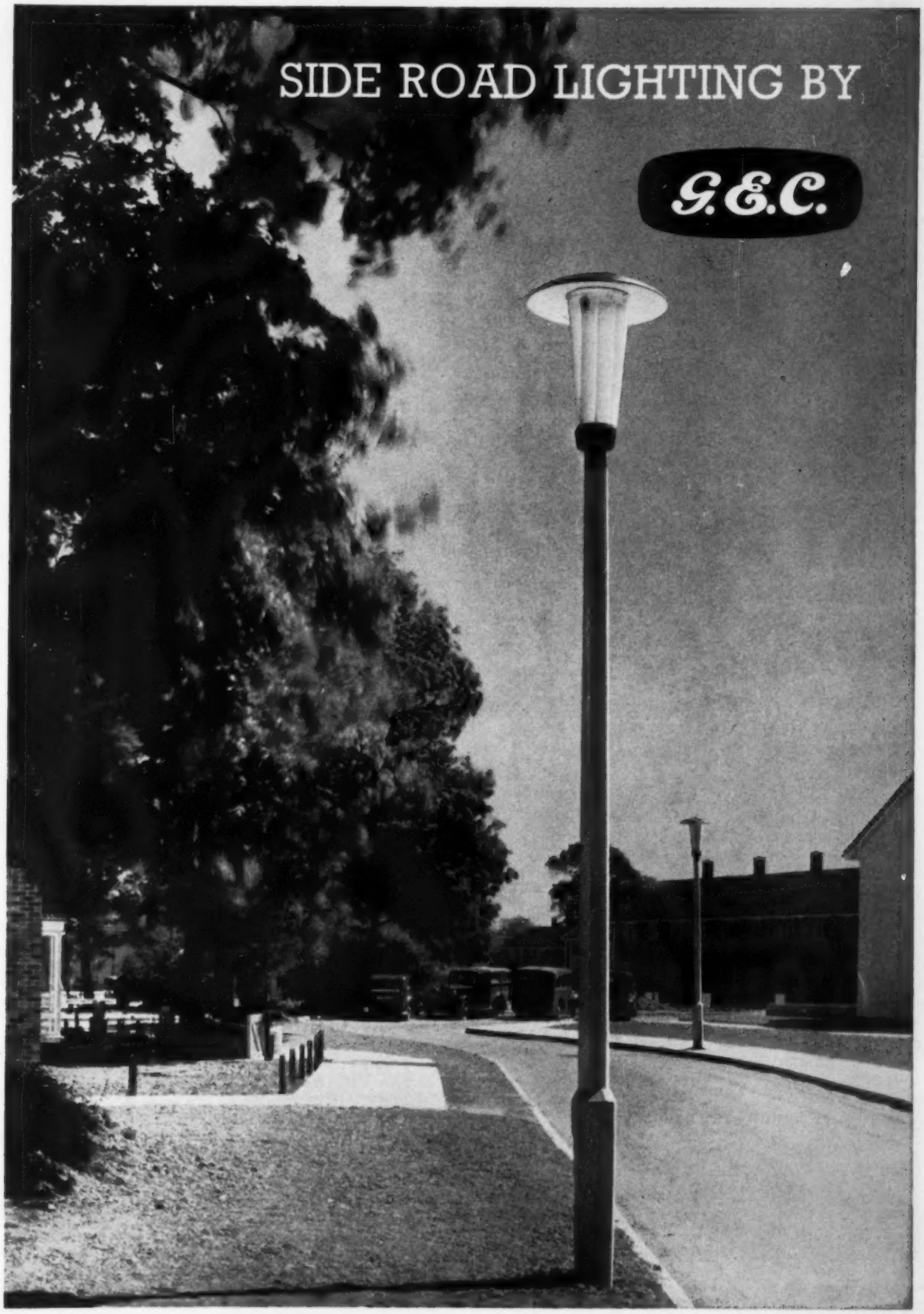
support sections

The PLASMATIC diffuser Panels and support sections may be used with the majority of suspended ceiling methods, the details illustrate a series of possible relationships with different types of suspended ceiling construction.

Two examples in which PLASMATIC diffuser panels have been used to form a Luminous Ceiling can be inspected at the Building Centre—one using Celotex ceiling construction, the other using a special system of fixing developed by Anderson Construction Co. Ltd.

TUBE LAMINATION & ENGINEERING LTD.

DESBOROUGH PARK ROAD, HIGH WYCOMBE, BUCKS. Tel. H.W. 4111/4



THE GENERAL ELECTRIC CO LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

STANTON

Prestressed Spun Concrete Lighting Columns

THE STANTON IRONWORKS COMPANY LIMITED · NEAR NOTTINGHAM

Stanton Type 8 Prestressed Spun Concrete Lighting Columns fitted with G.E.C. Z.8480 Fluorescent Lighting at the Llanrumney Shopping Centre, Cardiff.

Photograph by permission of E. C. Roberts, Esq., M.Eng., M.I.C.E., M.I.Mun. E., M.T.P.I., A.R.I.C.S., City Surveyor.

The Type shown is one of a wide range of Stanton designs approved by the Council of Industrial Design.

For further information please telephone Ilkeston 86 Extension 44 or write Lighting Column Sales Department.

MAIN PRODUCTS

PIG IRON
FOUNDRY, BASIC AND REFINED
CAST IRON
PIPES AND SPECIAL CASTINGS
GENERAL CASTINGS
TUNNEL SEGMENTS
SLAG
TREATED AND DRY
HOT AND COLD ASPHALT
COKE OVEN BY-PRODUCTS
BRICKS
CONCRETE
PIPES AND MANHOLES
LIGHTING COLUMNS
PAVING FLAGS
GENERAL PURPOSE SHEDS
PRESTRESSED CONCRETE
PRESSURE PIPES
LIGHTING COLUMNS

THE GENERAL ELECTRIC CO LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

designed BY DESIGNERS for designers

We have specialised in the manufacture of GOOD LIGHTING FITTINGS for nearly a quarter of a century.

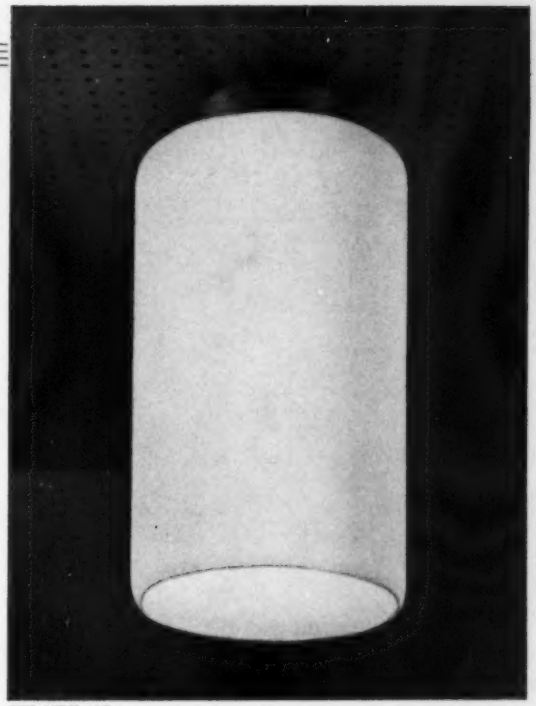
Illustrated is one example from our wide range—"The CYLAIRE /4C" 15" × 7" dia. 150/120w. Metalwork finished in satin anodised silver, with Satin opal glass ware. Lamp holders B.C. or E.S. included.

S. L. R. ELECTRIC LTD.

WELBECK WORKS, WELBECK ROAD, SOUTH HARROW, MIDDX.

Telephone: BYRon 3273/5
Telegrams: ESELAR HARROW

Send for details of our list number 37



CYLAIRE /4C
Satin Opal Glass Ware

SLR

CONTROL GEAR OF PROVED RELIABILITY

THOUSANDS UPON THOUSANDS IN EVERYDAY USE THROUGHOUT THE WORLD.

CAYSON ELECTRICS LTD

MANUFACTURERS OF LIGHTING FITTINGS AND MACHINES USING DISCHARGE LAMPS ARE INVITED TO SEND FOR DETAILED CATALOGUE

STANDARDIZED BY LEADING MANUFACTURERS FOR EVERY DISCHARGE LAMP FROM 6 W. to 3,000 W. INCLUDING SPECIALISTS' TYPES

CAYSON ELECTRICS LTD. WATFORD

WATFORD 7156 & 7177
London Office: ANGEL HOUSE, ANGEL, N.1 (TERminus 0566)

STANTON

Prestressed Spun Concrete Lighting Columns

THE STANTON IRONWORKS COMPANY LIMITED · NEAR NOTTINGHAM

Stanton Type 8 Prestressed Spun Concrete Lighting Columns fitted with G.E.C. Z.8480 Fluorescent Lighting at the Llanrumney Shopping Centre, Cardiff.

Photograph by permission of E. C. Roberts, Esq., M.Eng., M.I.C.E., M.I.Mun. E., M.T.P.I., A.R.I.C.S., City Surveyor.

The Type shown is one of a wide range of Stanton designs approved by the Council of Industrial Design.

For further information please telephone Ilkeston 86 Extension 44 or write Lighting Column Sales Department.

MAIN PRODUCTS

PIG IRON
FOUNDRY, BASIC AND REFINED
CAST IRON
PIPES AND SPECIAL CASTINGS
GENERAL CASTINGS
TUNNEL SEGMENTS
SLAG
TREATED AND DRY
HOT AND COLD ASPHALT
COKE OVEN BY-PRODUCTS
BRICKS
CONCRETE
PIPES AND MANHOLES
LIGHTING COLUMNS
PAVING FLAGS
GENERAL PURPOSE SHEDS
PRESTRESSED CONCRETE
PRESSURE PIPES
LIGHTING COLUMNS

designed BY DESIGNERS for designers

We have specialised in the manufacture of GOOD LIGHTING FITTINGS for nearly a quarter of a century.

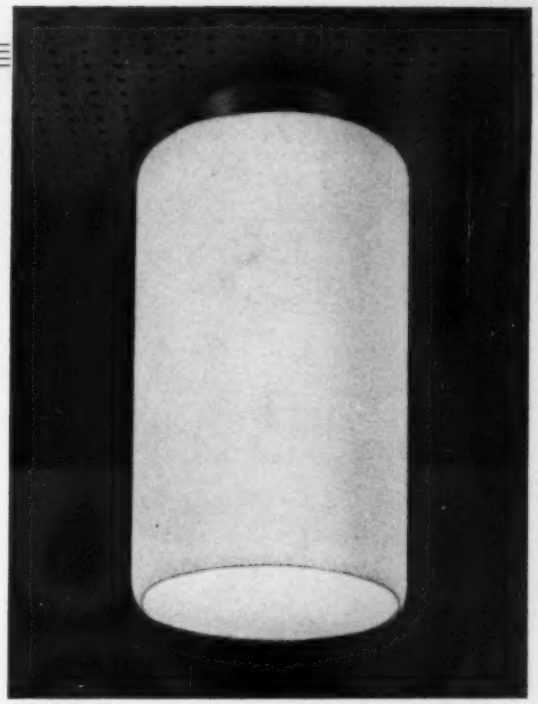
Illustrated is one example from our wide range—"The CYLAIRE /4C" 15" × 7" dia. 150/120w. Metalwork finished in satin anodised silver, with Satin opal glass ware. Lamp holders B.C. or E.S. included.

S. L. R. ELECTRIC LTD.

WELBECK WORKS, WELBECK ROAD, SOUTH HARROW, MIDDX.

Telephone: BYRon 3273/5
Telegrams: ESELAR HARROW

Send for details of our list number 37



CYLAIRE /4C
Satin Opal Glass Ware

SLR

CONTROL GEAR OF PROVED RELIABILITY

THOUSANDS UPON THOUSANDS IN EVERYDAY USE THROUGHOUT THE WORLD.

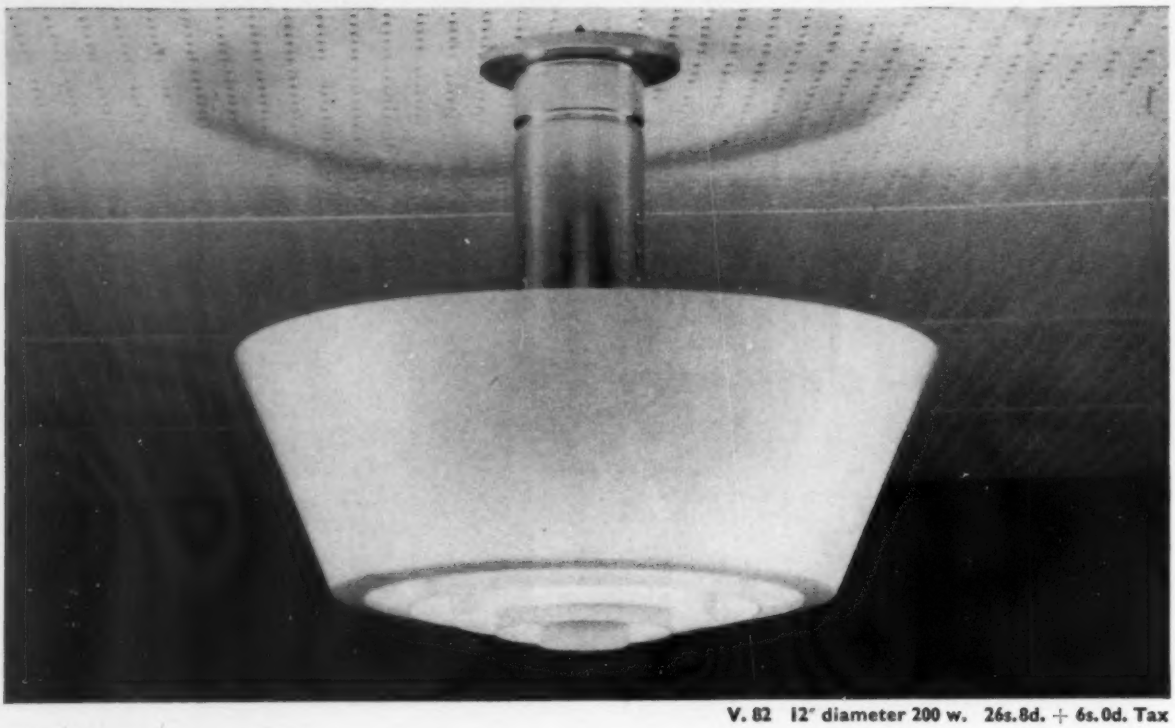
CAYSON ELECTRICS LTD.

MANUFACTURERS OF LIGHTING FITTINGS AND MACHINES USING DISCHARGE LAMPS ARE INVITED TO SEND FOR DETAILED CATALOGUE

STANDARDIZED BY LEADING MANUFACTURERS FOR EVERY DISCHARGE LAMP FROM 6 W. to 3,000 W. INCLUDING SPECIALISTS' TYPES

CAYSON ELECTRICS LTD. WATFORD

WATFORD 7156 & 7177
London Office: ANGEL HOUSE, ANGEL, N.1 (TERminus 0566)



V. 82 12" diameter 200 w. 26s.8d. + 6s.0d. Tax

VENTURA

Designed by Paul Boissevain, Dip. Arch., M.S.I.A.

A series in translucent white opal plastic

On the school programme alone thousands of pounds have been saved by specifying Venturas – with high standards of quality and lighting efficiency maintained.

For full information, including data on the new units with reflectors for use with higher ceilings, ask for publication V.88.

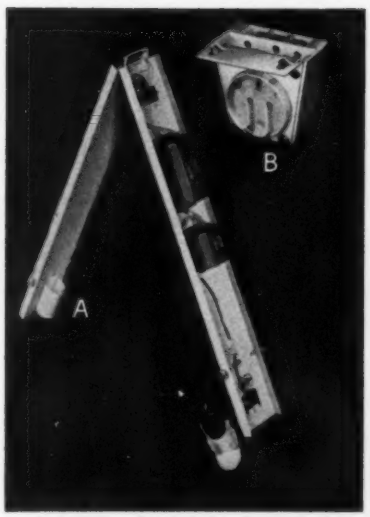
Venturas are available from stock throughout the world.

THE MERCHANT ADVENTURERS LIMITED

16-43 PORTLAND ROAD LONDON W.11 TELEPHONE PARK 1221 (5 lines)

atlas leads in lighting / **suggestions for large industrial premises**

atlas trunking



Atlas Industrial Trunking provides an economical and completely flexible lighting system which is adaptable to any factory layout. Highly efficient 8 ft. or 5 ft. fluorescent fittings can be spaced at intervals or in continuous runs, as required, and once installed can be changed around without difficulty to meet changes of factory layout. Cables for lighting and power or communication services are carried within the trunking and can be easily tapped. Among other unique features which make Atlas trunking economical to install and maintain are the hinged gear trays (a) which can be unhooked and removed for servicing; and (b) Atlas Atlantic spring-loaded bi-pin lampholders which enable one man to relamp even 8 ft. fittings. Atlas Lighting Engineers are available for consultation at any time, and will gladly call by appointment.

ATLAS LIGHTING LIMITED A subsidiary company of Thorn Electrical Industries Limited 233 Shaftesbury Avenue London W.C.2.

V. 82 12" diameter 200 w. 26s.8d. + 6s.0d. Tax

VENTURA

Designed by Paul Boissevain, Dip. Arch., M.S.I.A.

A series in translucent white opal plastic

On the school programme alone thousands of pounds have been saved by specifying Venturas – with high standards of quality and lighting efficiency maintained.

For full information, including data on the new units with reflectors for use with higher ceilings, ask for publication V.88.

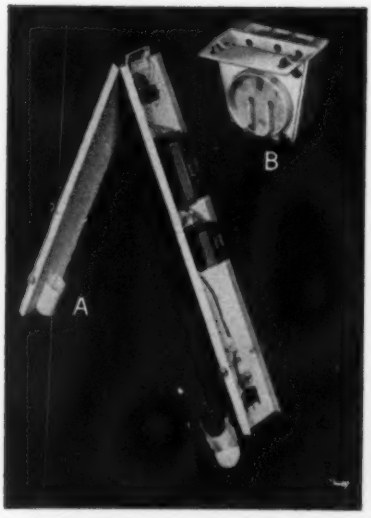
Venturas are available from stock throughout the world.

THE MERCHANT ADVENTURERS LIMITED

16-43 PORTLAND ROAD LONDON W.11 TELEPHONE PARK 1221 (5 lines)

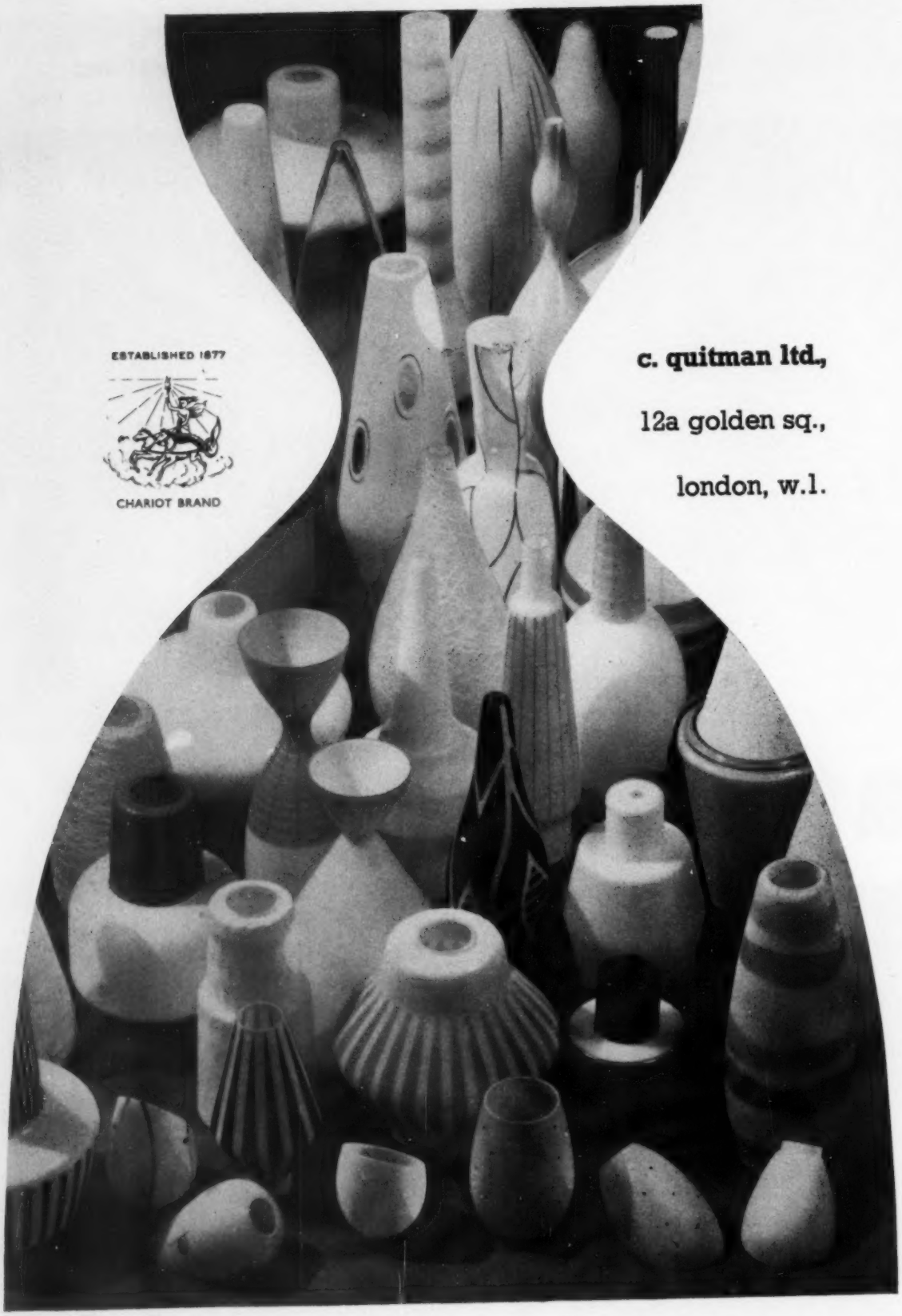
atlas leads in lighting / **suggestions for large industrial premises**

atlas trunking



Atlas Industrial Trunking provides an economical and completely flexible lighting system which is adaptable to any factory layout. Highly efficient 8 ft. or 5 ft. fluorescent fittings can be spaced at intervals or in continuous runs, as required, and once installed can be changed around without difficulty to meet changes of factory layout. Cables for lighting and power or communication services are carried within the trunking and can be easily tapped. Among other unique features which make Atlas trunking economical to install and maintain are the hinged gear trays (a) which can be unhooked and removed for servicing; and (b) Atlas Atlantic spring-loaded bi-pin lampholders which enable one man to relamp even 8 ft. fittings. Atlas Lighting Engineers are available for consultation at any time, and will gladly call by appointment.

ATLAS LIGHTING LIMITED A subsidiary company of Thorn Electrical Industries Limited 233 Shaftesbury Avenue London W.C.2.


ESTABLISHED 1877
CHARIOT BRAND
c. quitman ltd.,
12a golden sq.,
london, w.1.

Photograph by courtesy of Messrs. May & Baker Ltd., Dagenham

CEILING FITTINGS DESIGNED AND MANUFACTURED BY

Major

The Fittings illustrated are installed in the Entrance Hall of Messrs. May & Baker Ltd. New Chemistry Block at Dagenham, Essex.
They are 4ft. × 2ft. modules with dished opal "perspex" diffusers and four 4ft. Fluorescent tubes.
These fittings are also provided with Tungsten lamps for emergency lighting although this is a special feature.

Major 'Multi' Fluorescent Fittings

Give character plus maximum illumination to any interior

MAJOR EQUIPMENT CO. LTD., 22 GORST ROAD, LONDON, N.W.10 ELGar 8041 (5 lines)

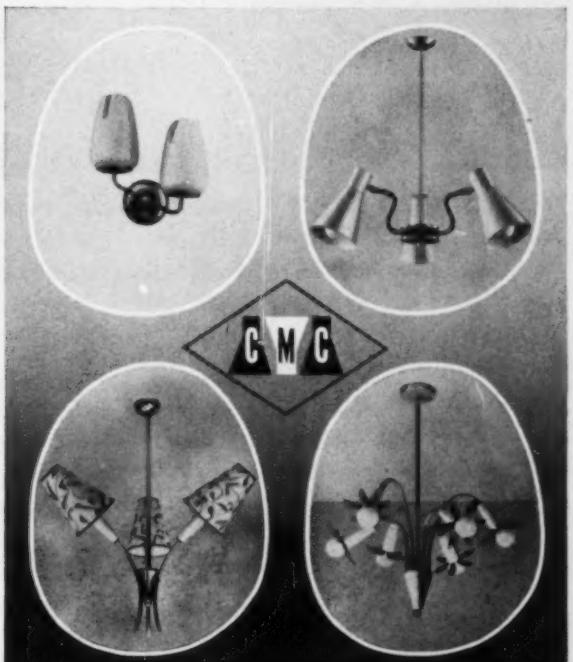
London Depot: 40 PARKER ST., KINGSWAY, W.C.2 CHA 9170 **Also Birmingham, Manchester, Coventry, North Shields, Edinburgh, Glasgow**

world famous glass

for exclusive lighting

Hiscock Appleby and co., ltd.

12/16 Holbein Place, Sloane Square, London, s.w.1



C. M. CHURCHOUSE LTD.
CLARENDON CROSS, LONDON, W.11
Tel. PARK 5666/7/8

Write for our new Catalogue No. 174

CEILINGS WITH STYLE

WORKING efficiency, improved appearance and important economies in the whole design of an interior are provided by a Lumenated Ceiling. Its clean, translucent surface diffuses light of correct intensity completely free of shadows, glare and high-spots. It also provides an attractive, contemporary ceiling at a lower level for modernising old interiors. Since lamps, wires and fittings are automatically screened, they need not be specially boxed or recessed, and no finish other than inexpensive whitewashing is needed to the structural ceiling.

Drawing offices require a high level of lighting and this is provided by a Lumenated Ceiling at the Bowater Trading Company Ltd., Northfleet, Gravesend, Kent. The attractive shadow effect in the above installation is of interest.

Good Looks with Economy. The Lumenated Ceiling has an attractive appearance whether the light is on or off. It is easy to keep clean and in good condition and its initial cost compares most favourably with other forms of lighting.

Further information is given in our booklet 'LUMENATED CEILINGS', including the fullest technical details. Recommendations will gladly be made for individual installations.

Full information from Lumenated Ceilings Limited and all branches of the General Electric Co., Ltd.

LUMENATED CEILINGS

PATENT NO. 756089

A BRILLIANT NEW IDEA IN ARCHITECTURAL LIGHTING

LUMENATED CEILINGS LIMITED

ALLIANCE HOUSE, CAXTON STREET, SW1. TELEPHONE: ABBEY 7113

10 BOTHWELL ST., GLASGOW, C.2. TEL: CENTRAL 6571/2. *Registered Offices:* THERMOTANK LTD., 150 HELEN ST., GLASGOW, S.W.1

TGA 1331/2

Light and
LIGHTING

Vol. 52. No. 4. April, 1959

Published by The Illuminating Engineering Publishing Co. Ltd. on the 1st of each month at 32, Victoria Street, London, S.W.1. Telephone: ABBey 7553. Subscription rate 30s. per annum.

contents

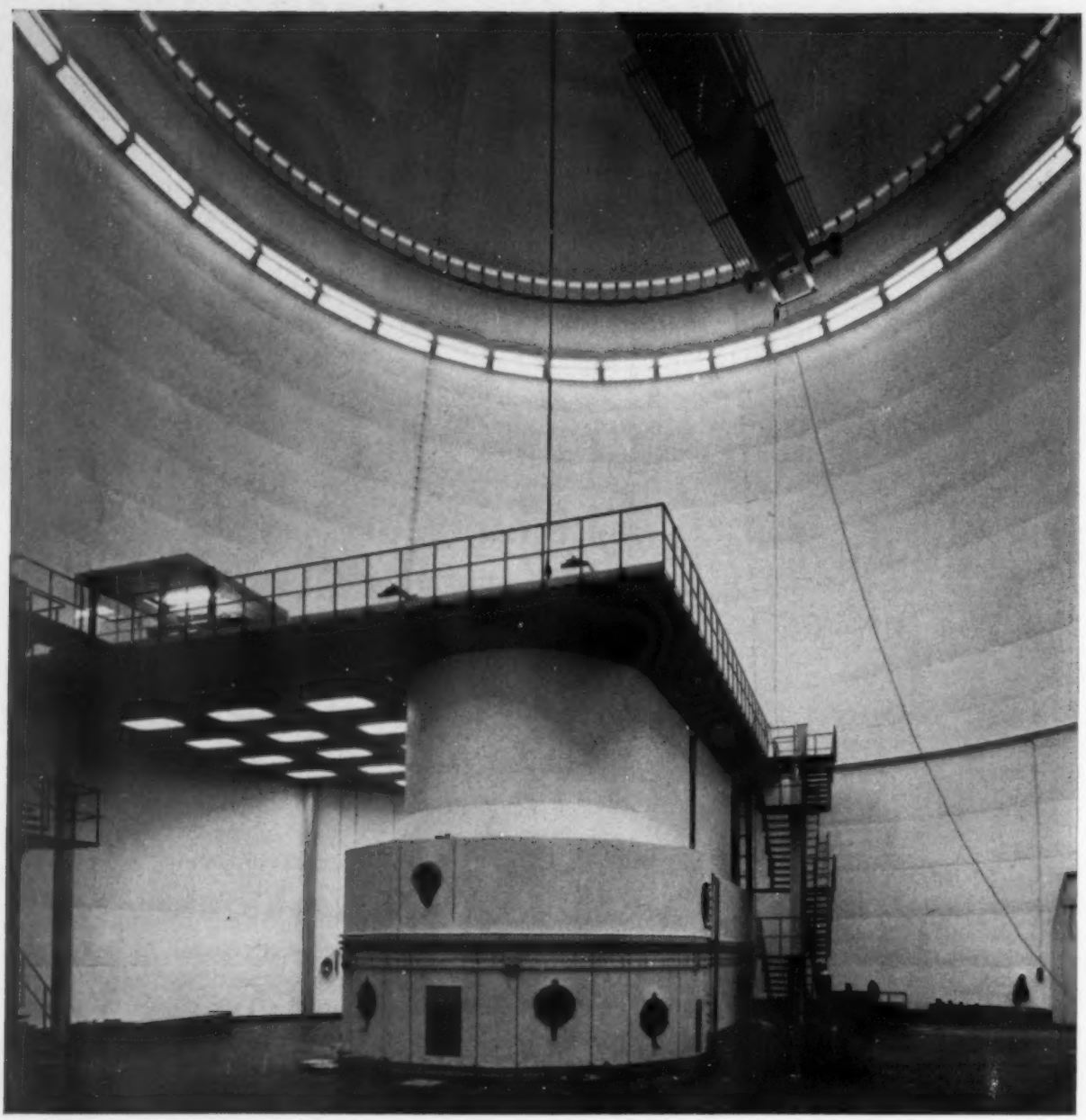
113 Editorial

115 International Review

142 IES Dinner

Lighting In Different Lands

IN the "country of the blind"—a figment of the imagination of a celebrated 20th century novelist—the inhabitants would have no problems of lighting. In all real countries, however, lighting is a subject of interest to the general population and also a matter of special concern to "selected populations" in each country who study lighting requirements, design lighting equipment and devise lighting installations. Once a year we make a special point of featuring an article dealing with applications and other aspects of lighting in different countries, so as to give our readers an extra-parochial view of recent developments. It is always possible to learn something from what others know and from what they are doing and—since few of us have the opportunity of doing much "globe-trotting" to see for ourselves the lighting in other lands—an illustrated report, such as this issue contains, cannot fail to be of interest. Lighting in all its aspects will come under review internationally this year for, in June, the International Commission on Illumination will meet in Brussels for its 14th Session. Some thirty "working" and "secretariat" committees of the Commission, each concerned with a different part of the broad subject, will be meeting and reporting upon progress made during the four years which have elapsed since the Commission met in Zurich for its 13th Session. In addition, 24 technical papers will be presented and discussed. These will deal with such topics as colour rendering, discharge lamps, conditions affecting comfort and discomfort, public lighting, photometry, basic data for computing desirable levels of illumination and natural lighting. As is usual at CIE Sessions, the United Kingdom will be well represented, and the British delegation will certainly be among the largest. Presiding at the Brussels Session will be our own Dr. J. W. T. Walsh. The exchanges of information among delegates from many parts of the world, and the discussions—both formal and informal—which take place when the CIE meets undoubtedly make for the advancement of the science and art of lighting.



Symbolising a year of scientific advance and the year in which West Germany replaced the UK as the world's second largest exporting nation, this photograph shows an experimental atomic reactor in Munich. In an egg-shaped windowless room 30 metres high there is a double ring of 82 fluorescent fittings half of which shine upwards to light the dome. More fluorescent fittings are recessed into the soffit of the platform.

An INTERNATIONAL REVIEW

of lighting progress in 1958

Our self-imposed task of preparing an annual review of lighting developments about the world gets more difficult each year. Not that there is any diminution in the amount of material submitted by our faithful correspondents; the difficulty is in making a selection from the many photographs which we receive. The text to accompany the pictures presents its own problem. Though in some cases we receive detailed information covering the whole field of lighting, in others we have only the briefest of information on installations which pictorially may seem the most interesting. Somehow a balance has to be struck so as not to over-emphasise any one achievement or branch of lighting. This year the accompanying text has been reduced to a few comments, the illustrations being in any case the most eloquent part of the feature.

Once again we have to thank our contributors who have helped to prepare this feature. They are Stuart Lay and Jack Whittemore (Australia), G. T. Watson (Canada), Bent Knudsen (Denmark), Esko Paivarinne (Finland), J. C. Kuenemann and Claude de Montclos (France), E. Wittig (Germany), V. Benzio (Italy), N. E. Hammond (New Zealand), J. Lillo (Spain) and Miss Ruby Redford, E. A. Lindsay and T. D. Wakefield (USA). We also thank Mr. A. W. Gostt who supplied information relating to a number of countries.

LIGHT SOURCES, the first tool of the lighting engineer, have not shown many outstanding developments during the past year though in most countries the range of lamps available, particularly discharge lamps, is gradually being extended.

A noteworthy development in mercury lamps comes from the USA where improvements in electrode design and emission materials have improved lumen maintenance to the extent that a new 400-watt lamp gives 65 per cent more light than previous lamps after 8,000 burning hours and 85 per cent of its initial output after 9,000 hours, a considerable advance.

Of special lamps it is noted that the low voltage projector lamps incorporating an elliptical specular reflector at the back and a spherical mirror in front which originated in Germany and Holland a year or two ago are now fairly widely available, their higher efficiency in 8-mm. film projectors being a great advantage.

The trend of recent years towards the use of higher wattage lamps continues, particularly in those countries where supplies of electricity are abundant. The desire to use bigger lamps, however, may not always be possible of fulfilment as for example in the North Island of New Zealand where until towards the end

of the year a lack of rain (strange though that may sound to some ears) caused a power shortage and low wattage lamps became the order of the day.

Nearly all the examples of new luminaires which have come to our notice are for tungsten filament lamps and have come from the countries we expected, i.e. Finland, Denmark and Australia. In addition to those luminaires shown under that heading, others can be seen in various installation pictures and it is obvious without reading the captions that they are Scandinavian or Finnish in origin. Some of them we think rather eccentric and somewhat removed from the designs of a few years ago which stimulated designers in other countries. For example the central fittings in the restaurant shown on page 138 look somewhat bizarre, particularly when used with the rather austere fittings over the tables in the window. Neither do we think we would like to dine at night in the restaurant shown at the foot of page 139 which appears to be lit only by the conical fittings suspended over each table as if to snuff out any diner who gets too boisterous. But, as we have said before, there is no limit to what you can do with a tungsten lamp.

The only interesting new fluorescent lamp luminaires come from Germany and include some decorative plastic fittings which are shown on page 119. The pendant fitting using 15-watt fluorescent lamps is particularly interesting. There is also an interesting fluorescent work-bench fitting (page 118) from Germany—which country also seems to favour local lighting on drawing boards (see page 132).

A development from the USA (similar to one which has just been announced in the UK) is a special type of louvre which will considerably help to reduce glare in high intensity installations. The louvre is of wedge shape in specular aluminised plastic which produces extremely low brightness above the 45 deg. cut-off angle and provides a means of having dark luminaires, irrespective of the light output, when viewed above that angle.

The variety of things that can be done to a ceiling in the cause of better lighting knows no bounds. Perhaps it would be fairer to say the ways in which the ceiling can be used are many—and many examples are included in the following pages. Little did we think when the egg-crate made its appearance years ago that so many variations on the theme could be possible. Whether the louvres are an inch or two apart or a few feet apart the principle as far as lighting is concerned is the same ; the materials and techniques now available enable the lighting engineer and architect in partnership to provide an interesting variety of textures for ceilings. The danger of monotony from large areas of luminous ceilings is appreciated and in most cases avoided.

What might be called ceiling treatment is by no means confined to offices and public buildings designed to impress the public, or to shops. There are already many examples in this country and in the USA of completely luminous and modular ceilings incorporating lighting equipment in factories. Examples of such lighting installations are now coming from other countries. The move towards tidying up industrial premises is now fairly general and in this the lighting engineer is making quite an important contribution. On pages 134-5 there are two interesting examples where the structure of the buildings has been used to produce efficient, if not particularly exciting, seeing conditions. The latter type of lighting, i.e. efficient and unexciting, still seems on the whole to be the lot of the office worker. In the larger office blocks the façade presented to the visiting public may be brilliant and stimulating but behind the scenes the story, even in new buildings, is usually only one of lots of lamps and fittings with some increase in levels of illumination—which is not, of course, unimportant.

On the whole the lighting of schools in other countries shows more imagination than that in this country. Perhaps there is more money available—or education taken more seriously in other countries.

Street lighting is one of the activities of the lighting engineer which never fails to produce something novel each year. It is a subject of topical interest at any time and in any place for every " man in the street " is an " expert " ; everyone who operates with a tape measure or tower wagon is the recipient of advice from

the passing public ; no new installation can be put into operation without some comment in the correspondence columns of the local newspapers. Be that as it may, it takes experienced engineers to produce the type of lanterns, columns and installations which are shown in this review. In some countries, particularly Italy and Germany, the colour corrected mercury lamp is growing in popularity.

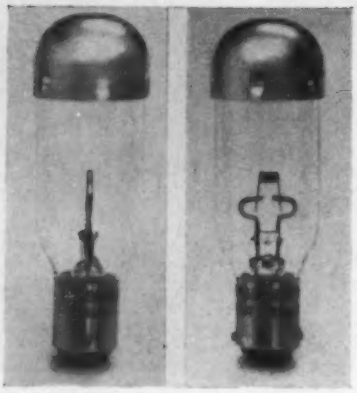
Though the newer light sources (including the xenon lamp) pose some technical problems, on the whole the technique of street lighting is well known and now takes second place to day-time appearance. In the November issue of *Light and Lighting* we made a comment, based on an artist's drawing which was all that was available at that time, on the type of columns which were then being installed in State Street, Chicago. We have since seen photographs of the installation and a photograph of the column used has been sent to us by the manufacturers, The Union Metal Manufacturing Co. of Ohio, who say that " nothing in recent years has stimulated as much spirited discussion as this revolutionary pole design." This we can believe. Technically no doubt the pole is ingenious ; æsthetically we still have our doubts. The installation in Chicago consists of 70 of these " tree-like standards " each holding four 7-ft. six-lamp luminaires, one at 36 ft., two at 34 ft. and the other over and parallel to the sidewalk at 24 ft. The spacing is 70-90 ft. Each luminaire houses six 6-ft. power-groove lamps. The diameter of the cast steel base at pavement level is 34 inches. The illumination on the road is 14 lm/ft.^{2}. (A picture of the column is included on this page, not to draw particular attention to it but because the photograph was received after the following pages had gone to press.)

Two very interesting installations on pages 122 and 123 are the bridge in Florence and the xenon lamp installation in Munich (see *Light and Lighting*, January, 1959, for full details). The lighting of bridges from the parapets seems to have been more successful than was first expected. The idea of lighting from an inverted trough down a central reservation is ingenious ; we shall be interested to hear if the idea spreads—and if it works on a bridge there would seem to be no reason why it should not work on other roads.

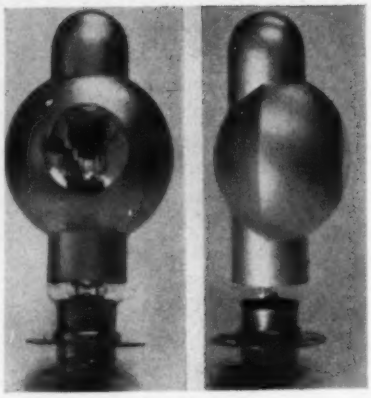
The trend in shops is always towards higher and yet higher levels of illumination and the supermarkets (one of which is shown on page 136) which are springing up all over the place are by no means behind in this respect. The installation at the foot of page 137 is included as we hope someone will tell us why it is necessary (or perhaps only desirable) to have 400 lm/ft^2 to sell ladies' shoes and why it is therefore necessary to have such an apparently heavy and bulky suspended ceiling.

It is by now well known that the American IES on its interpretation of Blackwell's researches is recommending higher illumination levels. The annual report of the American IES Committee on Progress (*Illuminating Engineering*, January, 1959) is entitled " Reaching for the Sun." In 1952 American industrial lighting recommendations ranged from 10 to 500 footcandles ; this year (1959) these recommendations are doubled and are now 20 to 1,000 footcandles and, it is stated, there are clear indications that these values are conservative. " Perhaps," says the report, " in the '60's these recommendations will be doubled again on the basis of further research and changes in economic conditions which will then show more user benefits at these higher levels." We do not wish here to examine the American statements—though we had the impression that Blackwell's research and the interpretation thereof had produced the answers for all time ; and further we wonder what economic advantages there can be in illumination levels above 1,000 footcandles. The point we wish to make is that there is already evidence that when the illumination gets into the hundreds of footcandles (to retain the American term) great care has to be exercised to introduce some interest into the installation. High levels and high brightness don't mean an interesting and stimulating job. Some variety must be introduced such as colour, movement or shadow. Perhaps come the 60's we shall include in this annual review only installations where the illumination level is comparatively low and where the lighting designer has used some skill. We hope it doesn't come to that.

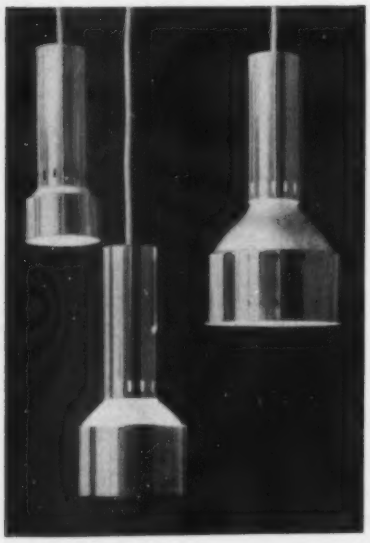
LAMPS



GERMANY Left, flat-core-coiled filament lamps (12v, 100-watt) for 8mm film projectors, giving greater useful flux than the coiled-coil type usually used, because of the flat form and the more uniform brightness of the filament. Right, 8v, 50-watt lamps incorporating an elliptical specular reflector at the rear and a spherical mirror on the front of the filament, giving improved efficiency in 8mm film projectors by omission of the condenser lens. (Osram, Munich).

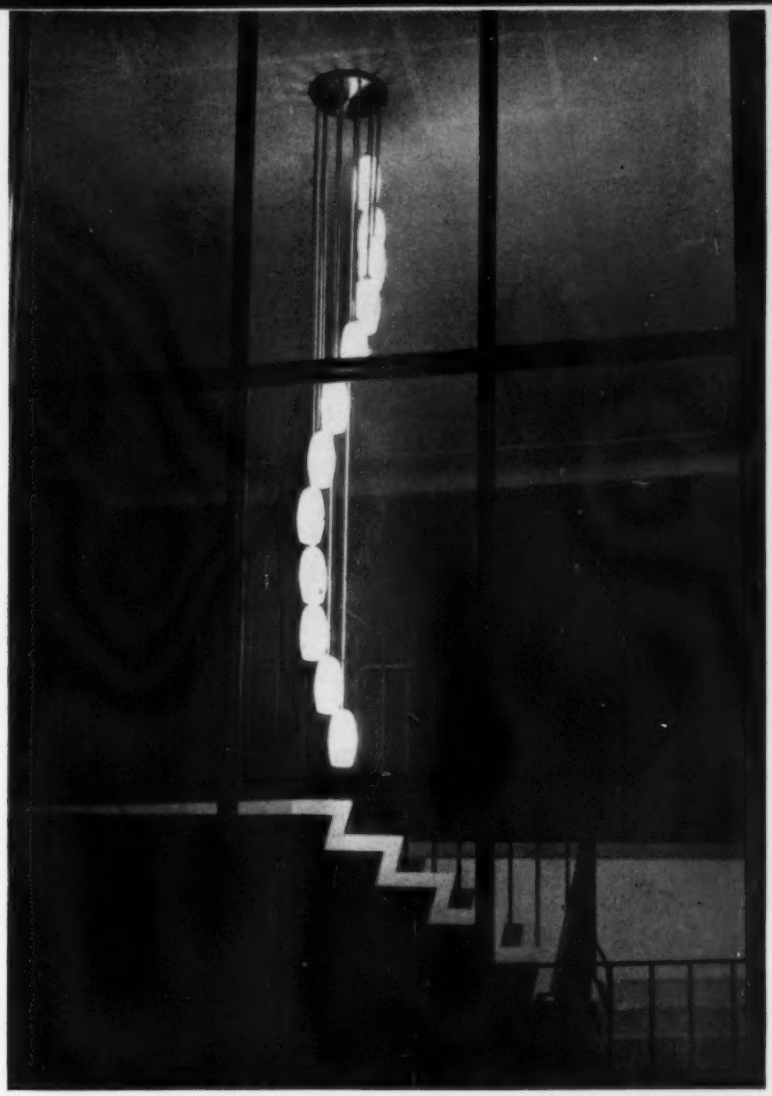


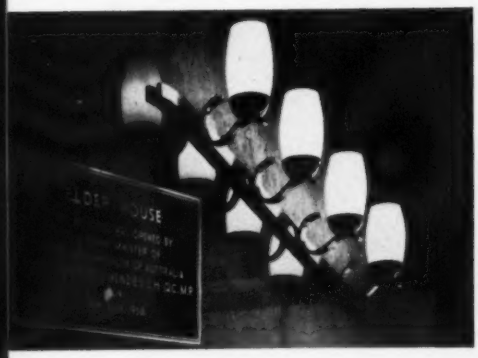
LUMINAIRES



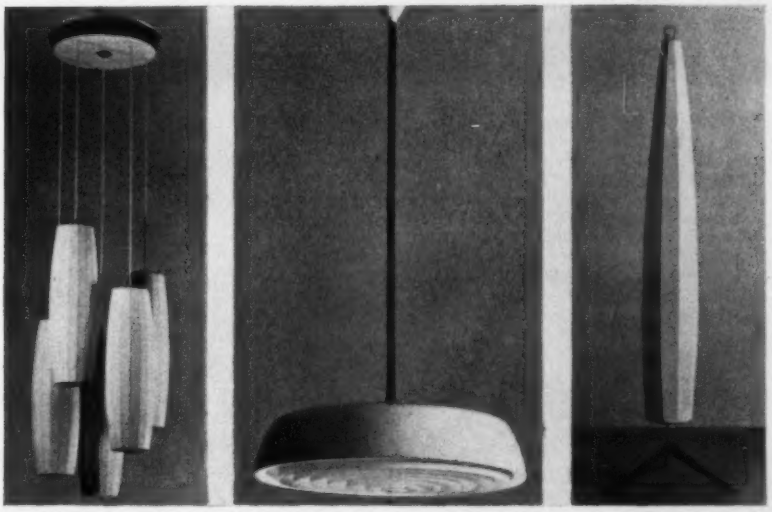
FINLAND Above left, tungsten reflector lamps fitted with polished aluminium shields. Above right, direct-indirect floor fitting ; ring louvre at bottom and glare diffuser at top of metal reflector.

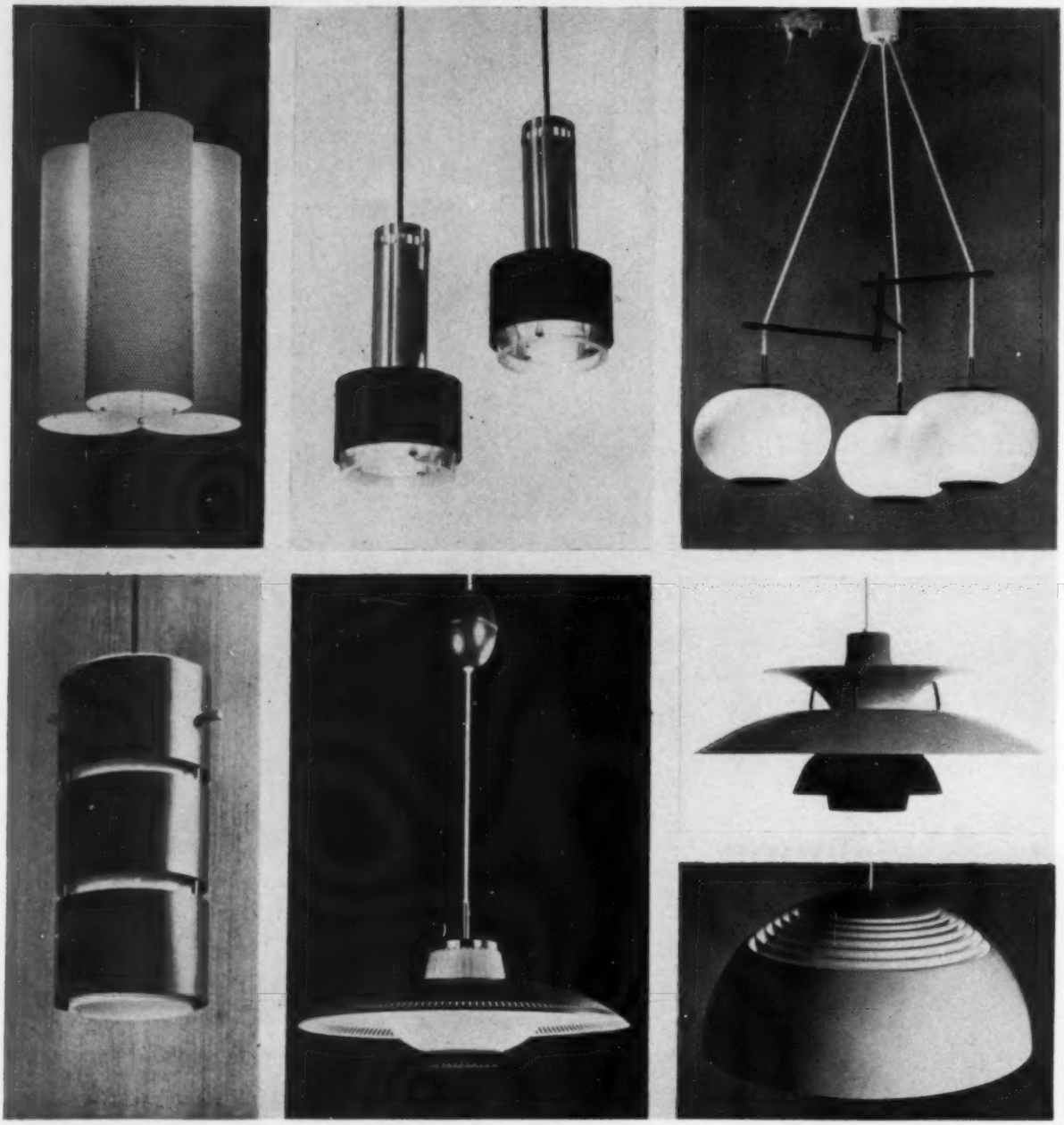
GERMANY Below left, workbench fittings for 40-watt U-shaped fluorescent lamp. The body consists of polyester resin reinforced with glass fibre ; the bracket is insulated by a shrunk-on plastic skin. (AEG, Frankfurt.)





AUSTRALIA Lighting fitting manufacturers are now following in the footsteps of their European counterparts. Above and left, " de-lustered " opal-glass fittings in Sydney, N.S.W., office buildings, designed by W. Allen Smith. **GERMANY** Decorative fittings with diffusing plastic shades by Kaiser & Co., Neheim-Hüsten. Below, from left to right, pendant fitting with five barrel-shaped shades each housing two 15-watt fluorescent lamps ; circular pendant with louvred cover for 32-watt fluorescent lamps ; floor standard with obelisk-shaped shade housing 40-watt fluorescent lamp.



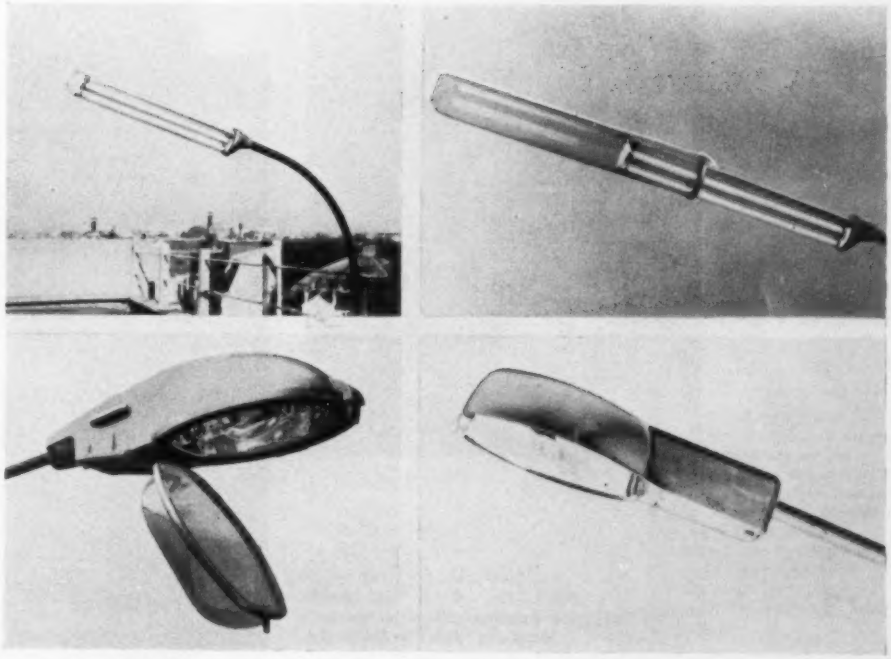


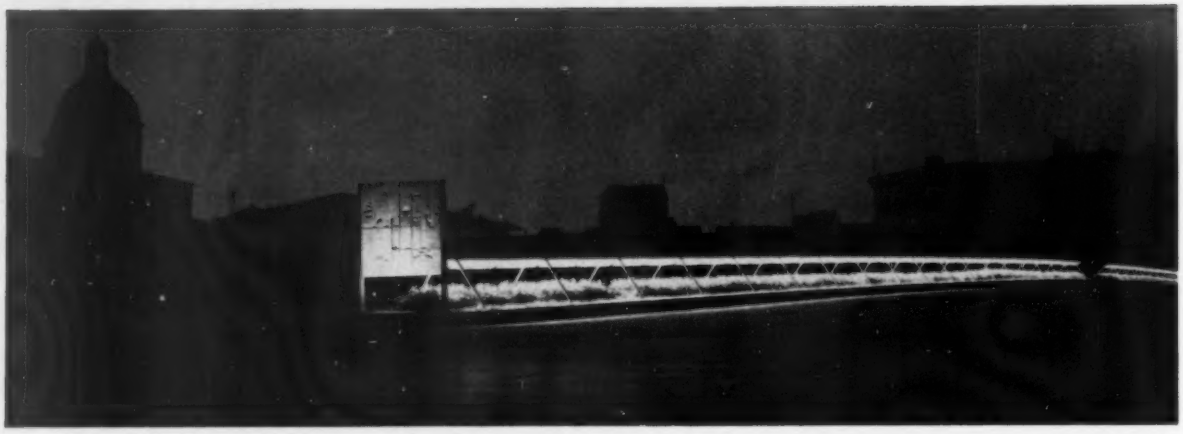
DENMARK 1-5, Fittings by Lyfa, Copenhagen. 1, " Silo " pendant designed by architect Piet Hein ; 2, pendants with inner shades of " Orrefors " crystal glass designed by architect Koerbing ; 3, " Pagode " pendant with decorated glass shades ; 4, pendant with inner shade of opal plastic and metal " over shades " designed by architect Torsten Johansson ; 5, rise and fall pendant with perforated spun-metal reflector over decorated opal glass shade ; 6 and 7, pendant fittings, by Louis Poulson & Co, designed by (6) Poul Henningsen (7) Arne Jacobsen.

1	2	3
4	5	6/7

STREET LIGHTING

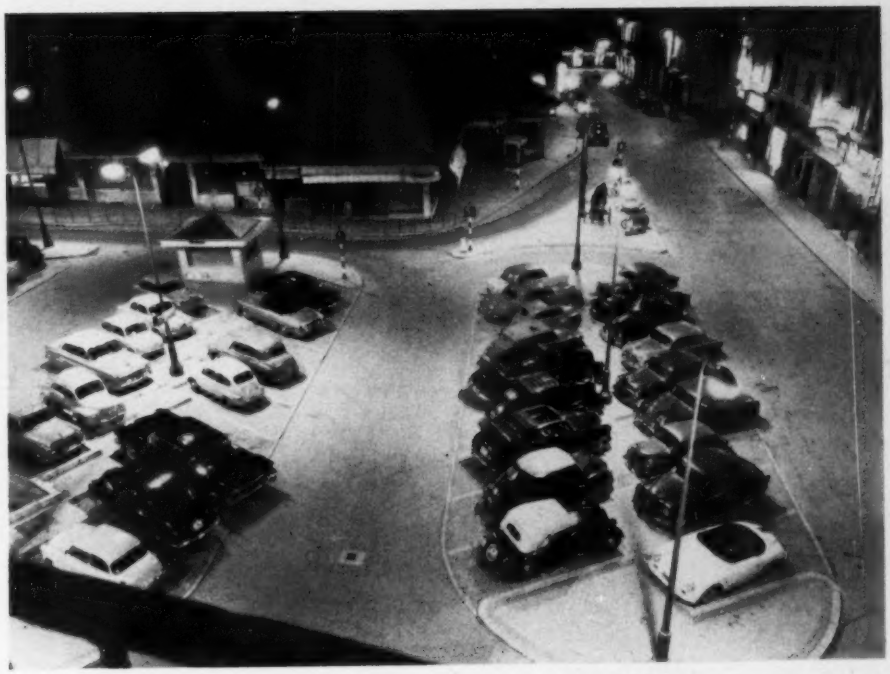
GERMANY Above, whip-shaped concrete standards, 9.5m high, spaced at 40m, carrying lanterns with oval-shaped specular reflectors. (Siemens-Schuckert, Erlangen.) FRANCE Right (top), lantern for three fluorescent lamps with slide-off plastic cover. (Philips, France). ITALY Right (bottom), lantern for 400-watt mercury-vapour lamp, with specular aluminium internal reflector and hinge-down prismatic glass refractor. The cast aluminium casing houses the choke. (Buini and Grandi, Bologna).



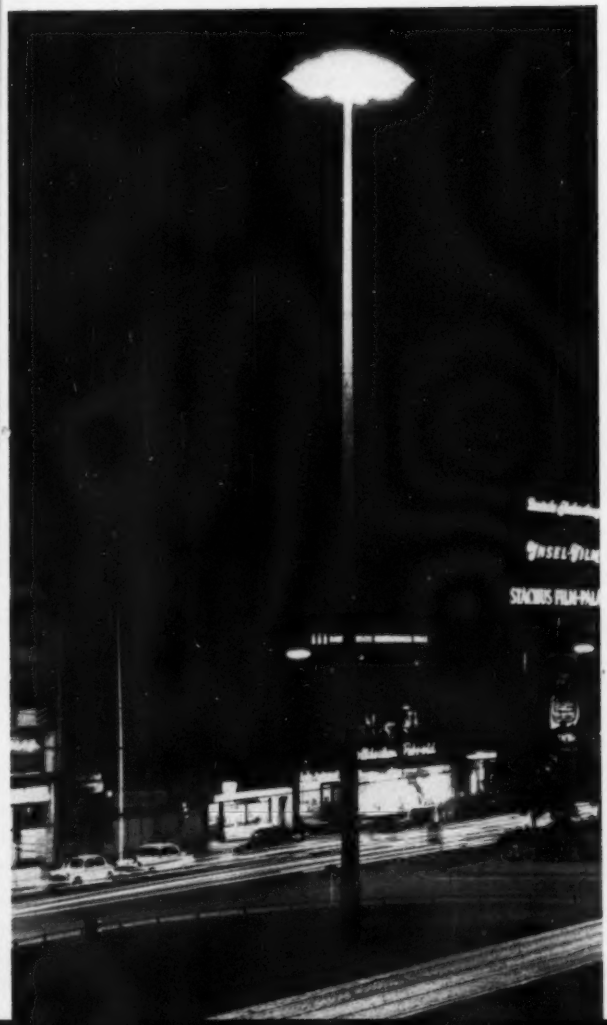


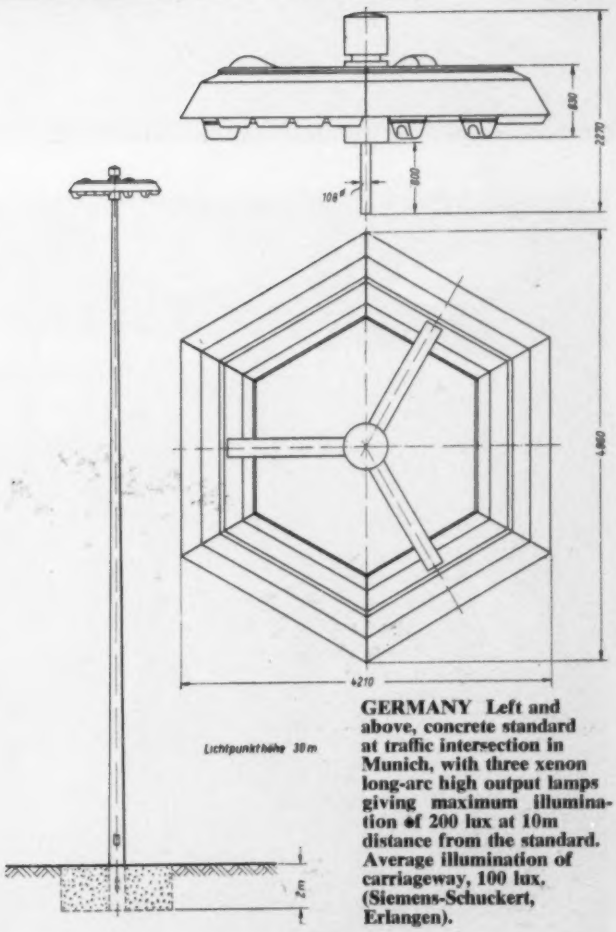
ITALY Above, the Amerigo Vespucci bridge in Florence lit by 120 40-watt fluorescent lamps installed in an inverted trough down the centre of the roadway. (ACET-Florence). GERMANY Left, in the grounds of the Hanover Fair, big annular standard for crossings, car parks, etc., with six oval-shaped lanterns each housing a 250-watt colour-corrected mercury-vapour lamp with specular reflector. (Siemens-Schuckert, Erlangen).

FINLAND Right, opal plastic luminaire housing 150-watt tungsten lamp for lighting footpaths.



SPAIN During the past year over 1,500 new street lights have been installed in 25 miles of streets and roads of Madrid. During the current year 24 million pesetas are to be spent on the modernisation and improvement of the existing lighting system. In most installations 400 and 1,000-watt colour-corrected mercury-vapour lamps are used giving a lighting level of about 20 lux, as in this area of the Plaza del Carmen.



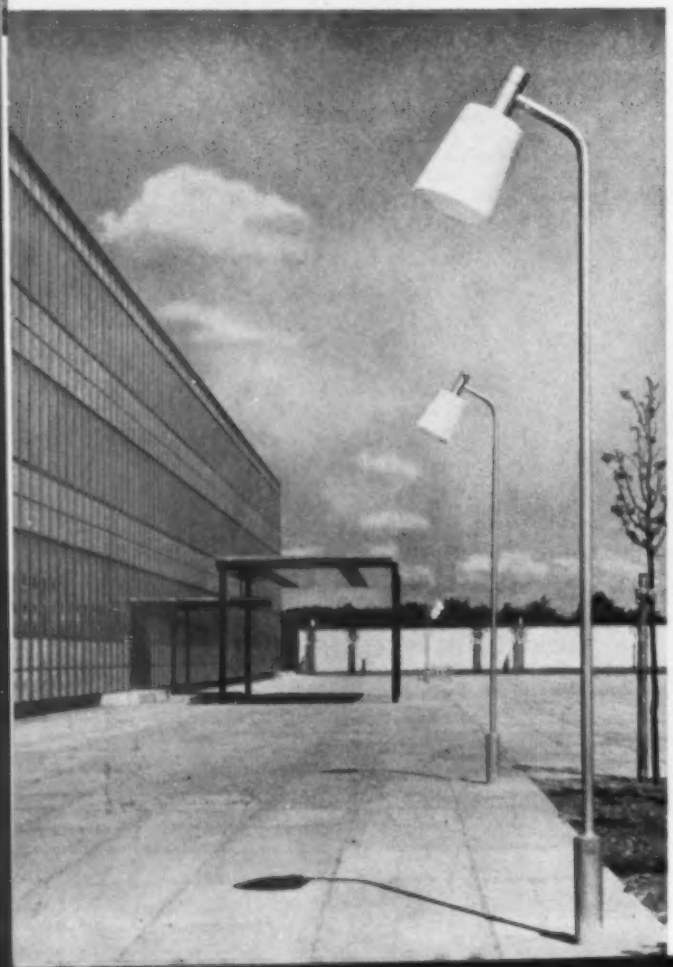


GERMANY Left and above, concrete standard at traffic intersection in Munich, with three xenon long-arc high output lamps giving maximum illumination of 200 lux at 10m distance from the standard. Average illumination of carriageway, 100 lux. (Siemens-Schuckert, Erlangen).

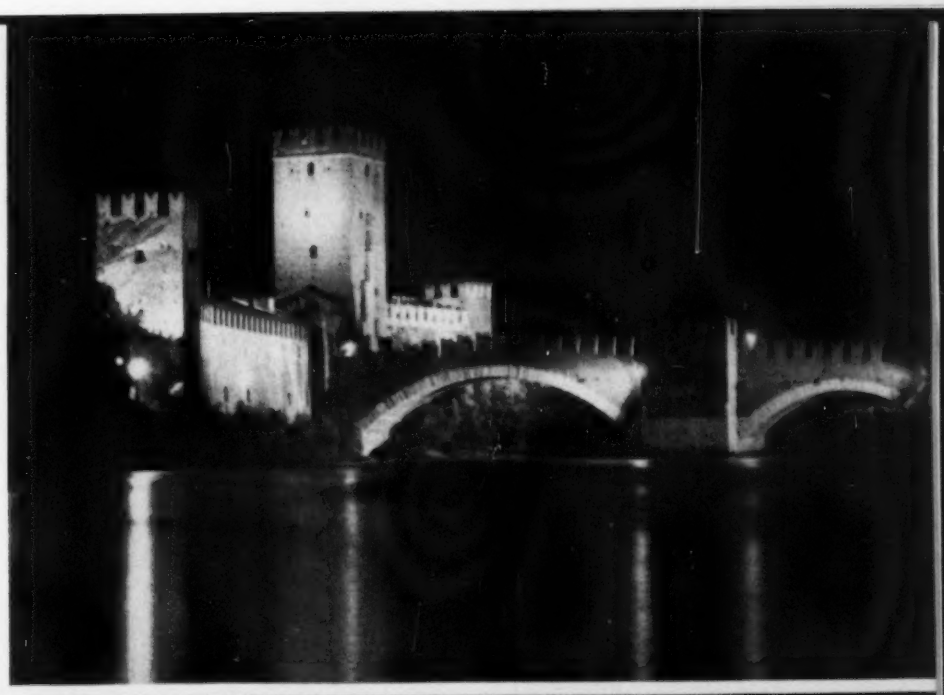
OTHER EXTERIOR LIGHTING

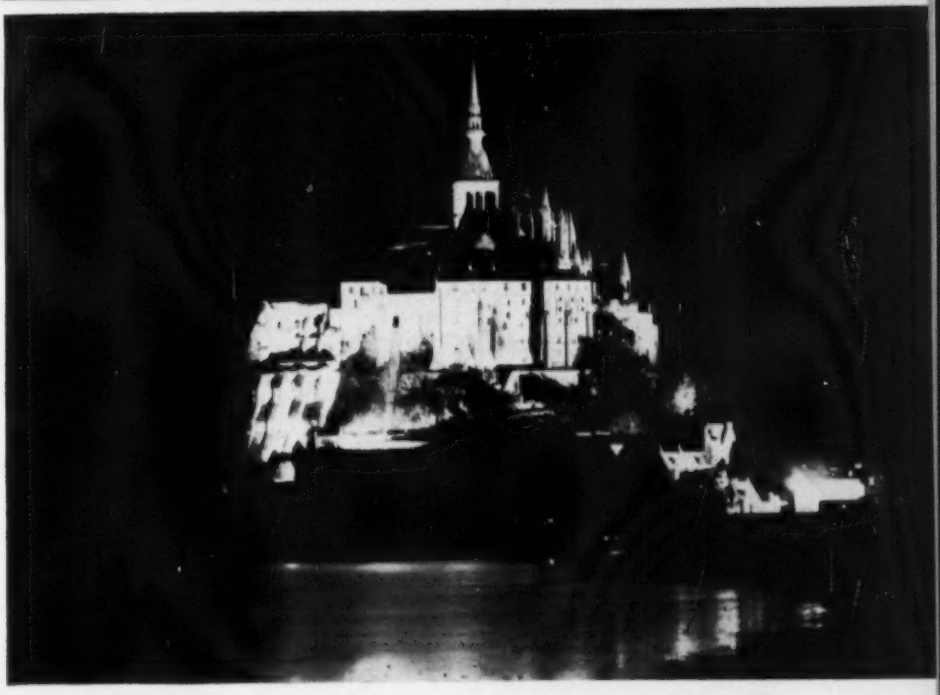
GERMANY Above, a large railway shunting yard at Saarbrucken lit by 140-watt sodium lamps in enamelled cut-off reflectors mounted at 12m, spacing 40m. (Philips, Saarbrucken). DENMARK Left, parking area in front of hotel in Copenhagen lit by louvred fitting housing two 200-watt half silvered lamps, specially designed by architect Koppel. (Lyfa, Copenhagen).

FRANCE Above, canopy, entrance and reception area of Hotel de Paris. Fixed to the canopy are 28 internally-silvered 60-watt spotlights. In the reception area five rows each of 15 60-watt tungsten lamps are recessed into the sloping ceiling. (Mazda, Paris). **GERMANY** Below left, dry dock lit by fittings resistant to water pressure. Each fitting houses a 40-watt fluorescent lamp. (Siemens-Schuckert, Erlangen). Below right, sluice lit by cut-off lanterns housing sodium lamps. (Philips, Hamburg).



BELGIUM Above, Esplanade at the Brussels Exhibition lit from 30m high columns each of which supported four special fittings each housing three 1,000-watt colour-corrected mercury lamps and one 1,000-watt tungsten lamp. (Philips, Eindhoven). DENMARK Left, outdoor lighting at Rodovre town hall designed by the architect for the building —Arne Jacobsen. (Louis Poulson & Co.) HOLLAND Below, high-intensity street lighting in Rotterdam. (Philips, Eindhoven).



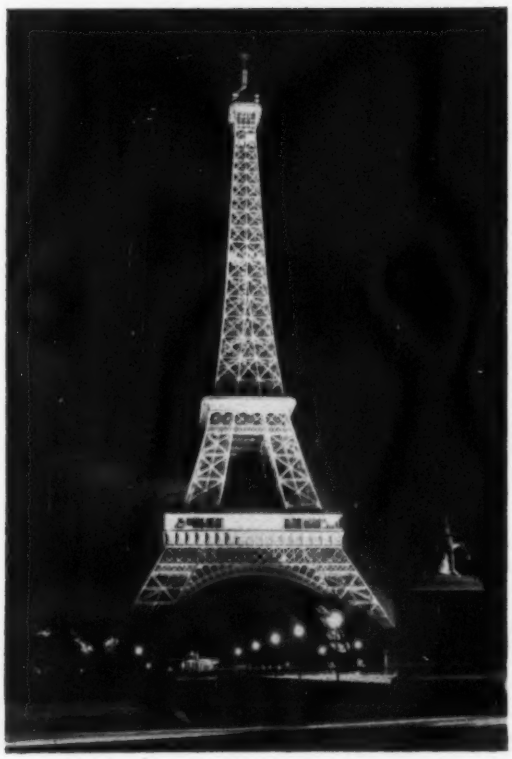


ITALY Right (top), incandescent floodlighting of Verona Castle and the adjacent bridge over the river Adige. (Buini & Grandi, Bologna). FRANCE Right (centre), the Mont St. Michel floodlit by ten high-powered projectors. (Mazda, Paris).

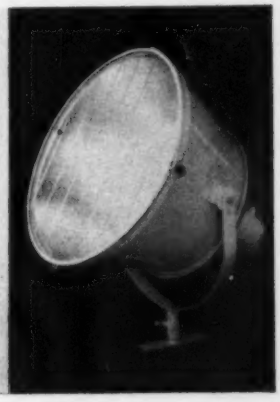
FLOODLIGHTING

FRANCE Towers at the port of la Rochelle. (Mazda, Paris).

ITALY Left, floodlighting of central tower and wings of the Sforza castle, Milan. (Buini & Grandi, Bologna). DENMARK Below left, the Dypilon (gateway) at Carlsberg Breweries, Copenhagen, lit by sealed-beam spotlights in water-tight housings. (Philips, Copenhagen). CANADA Below right, tower of the Canadian Bank of Commerce, Toronto—said to be the tallest building in the British Commonwealth, with a height of 476 ft. A 26kW floodlighting installation comprises 164, 140-watt sodium lamps, with trough-shaped "Alzak" reflectors giving horizontal and vertical spreads of 147 and 130 deg. respectively. (Amalgamated Electric Corp., Toronto).

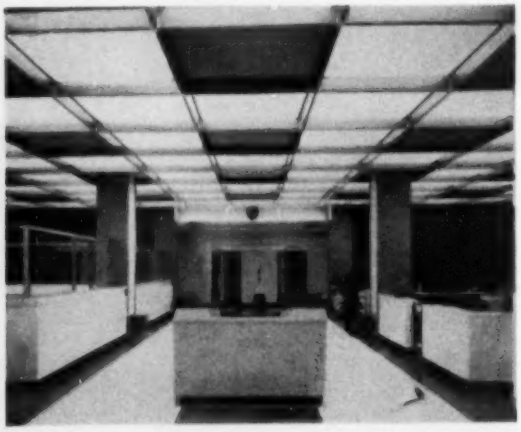


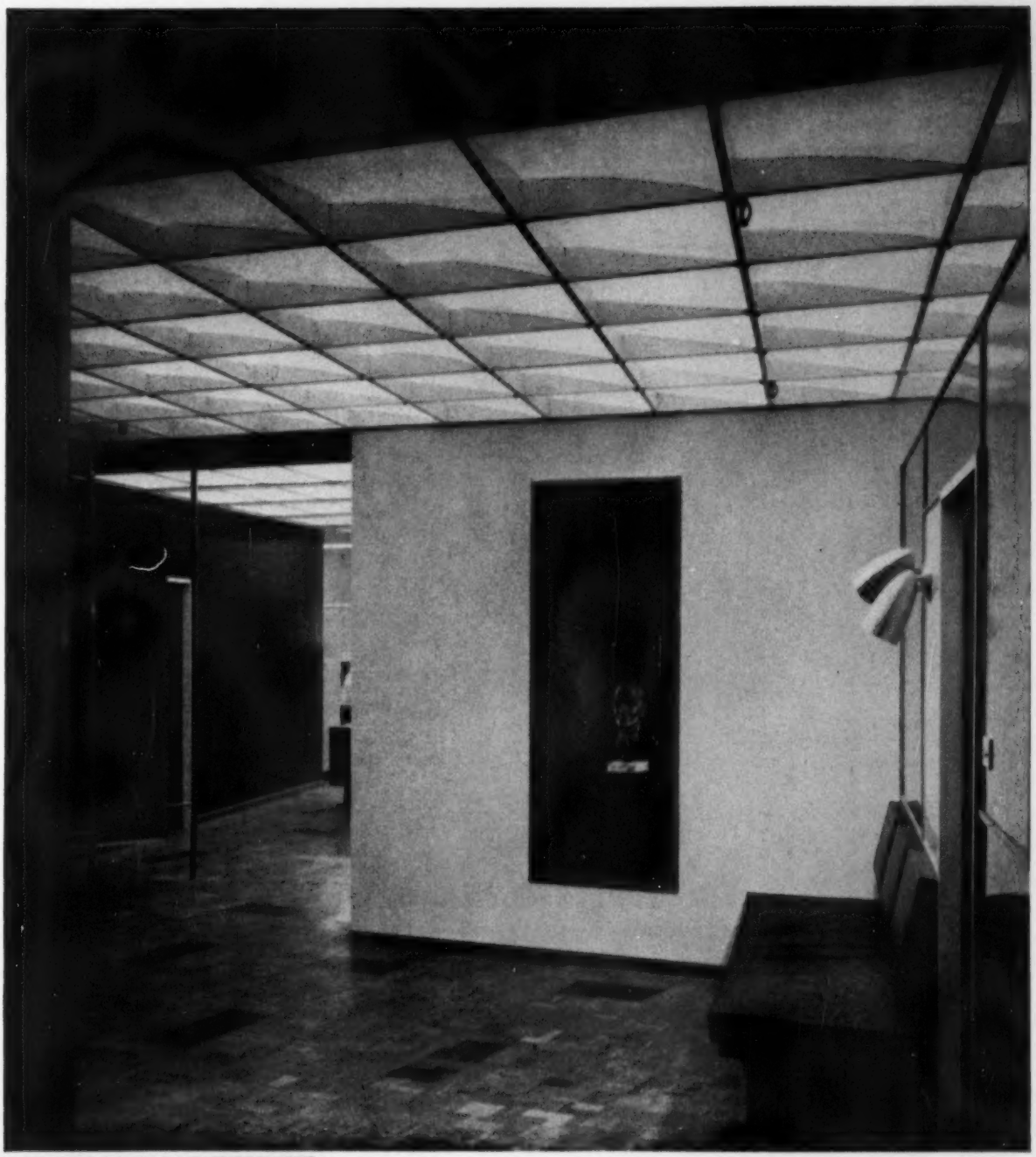
GERMANY Above, Kongress-Hall, Berlin. The large reinforced concrete arches carrying the roof of the hall are lit by 64 tungsten floodlights. The fountain, with its 10 jets, is lit by 20 500-watt underwater spots. (Siemens-Schuckert, Erlangen). **FRANCE** Left, new floodlighting of the Eiffel Tower. (Mazda, Paris). **ITALY** Below left, floodlight for 400/1,000-watt mercury lamps. Internal reflectors are adjustable so that beam can be modified. (LAPI, Leghorn).



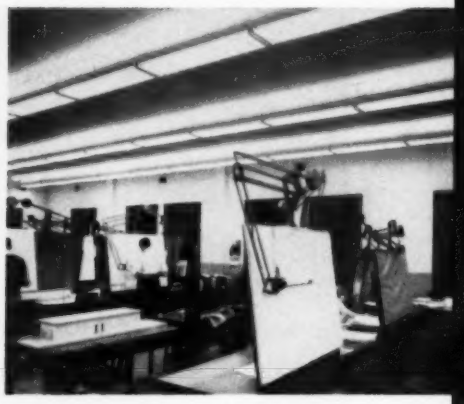
AUSTRALIA Left, fitting designed especially for re-lighting of the English, Scottish and Australian Bank, Melbourne, with its 1883 neo-Gothic banking hall and hand-painted ceilings. The new fittings of opal " Perspex " each house 12 40-watt fluorescent lamps, providing an illumination level of about 20 lm/ft^2. (Lawrence & Hanson Electrical (Vic) Pty.) **GERMANY** Below left, banking hall in Hanover with coffered luminous ceiling, lit by fluorescent lamps. (Philips, Hamburg). **USA** Below right, 600v. 840-cycle high-frequency lighting installation in the windowless air-conditioned premises on the Federal Reserve Bank, Houston, Texas. (Wakefield, Ohio). **DENMARK** Bottom left, head office of the Danish Sugar Refinery, Copenhagen. Recessed into the modular ceiling are fluorescent fittings each housing three 30-watt lamps. Covers are of " Fotalite " glass. (Lyfa Ltd, Copenhagen). **USA** Bottom right, luminous ceiling of " Wakon " corrugated vinyl in 3 ft. x 8 ft. panels in the First Federal Savings and Loan Bank, Uniontown, Pennsylvania. (Wakefield, Ohio).

OFFICES AND BANKS





AUSTRALIA Above, lobby and (in background) reception area at the head office of E. E. Whitmont & Sons Pty, men's wear manufacturers. Cold-cathode fluorescent lamps are concealed by luminous ceiling comprising diagonally arched acrylic plastic diffusers in 4in high coffers. (Claude Neon Ltd.) AUSTRALIA Left, night view of Unilever House, overlooking the harbour at Sydney's circular quay. (Noyes Bros. Pty. Ltd.)

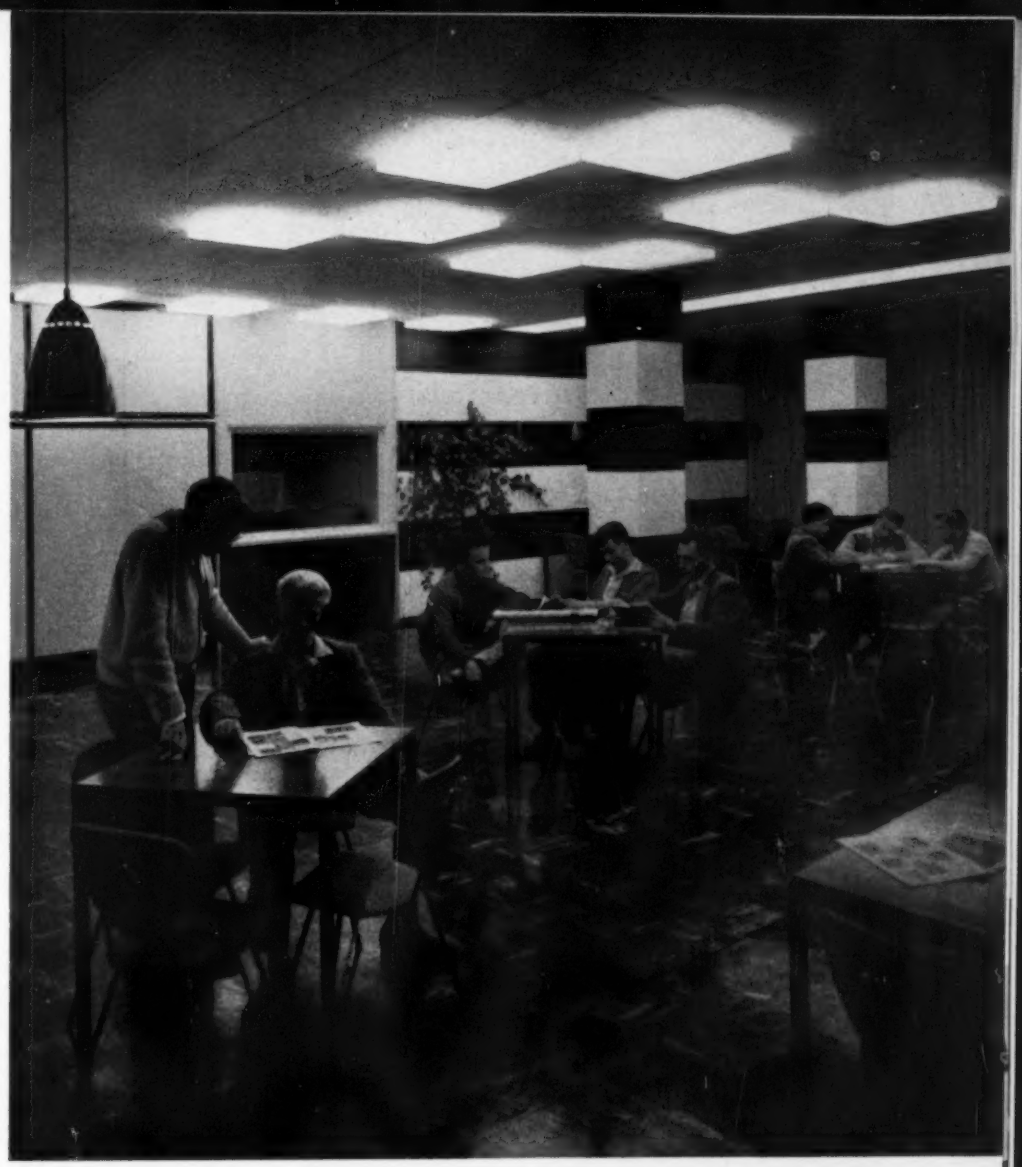


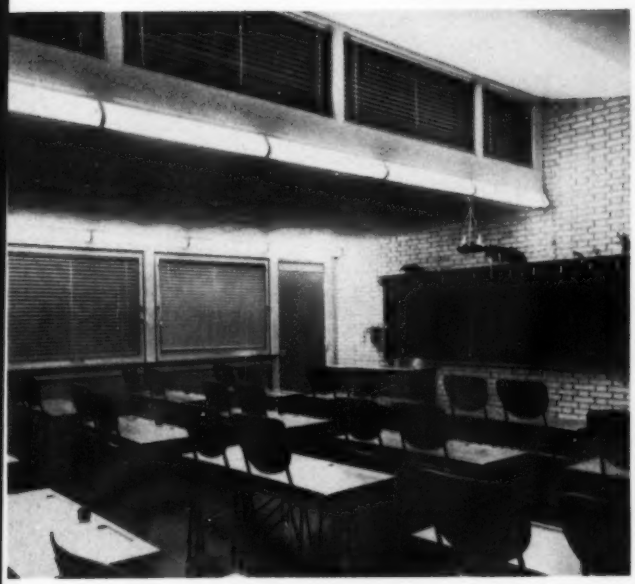
DRAWING OFFICES

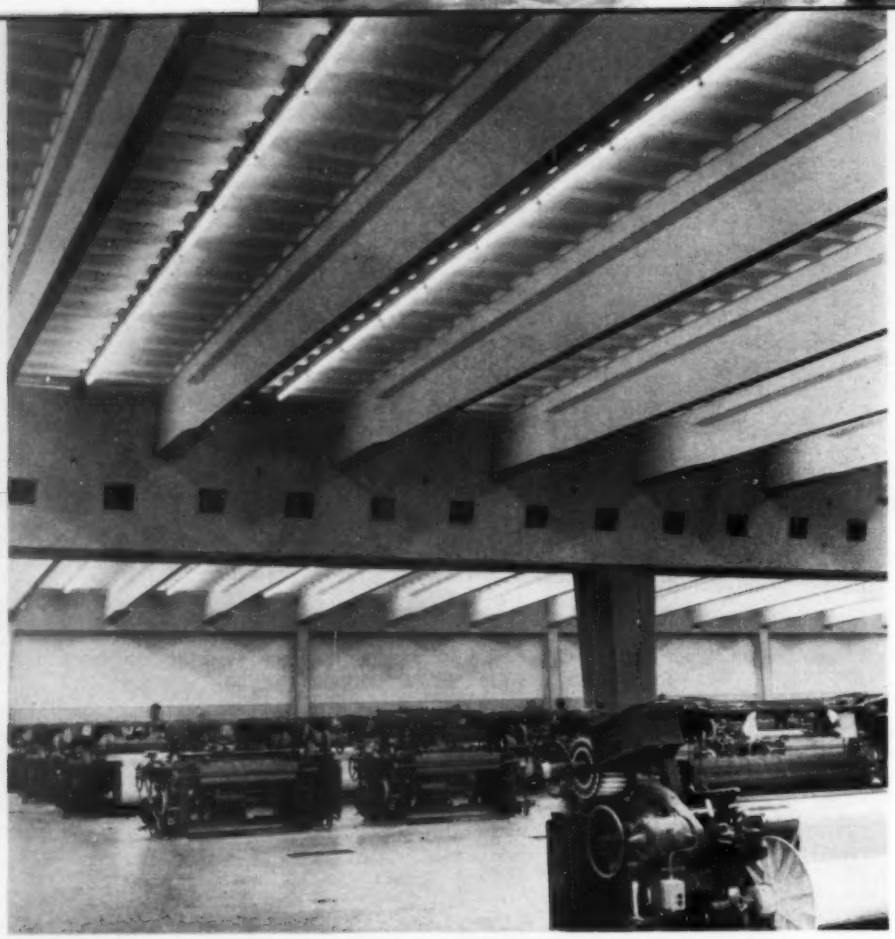
Three different approaches to the lighting of the drawing office are illustrated by these three photographs : With general lighting only (AUSTRALIA) in the example above—I.C.I. drawing office with near vertical boards lit by continuous rows of twin 40-watt fluorescent fittings with 30-40 per cent upward component and 45 deg. cut-off. The central spine is shaped to reflect light on to the ceiling and reduce brightness contrast. (Australian Electrical Industries) ; With fluorescent local lighting (GERMANY) as left. Fittings cantilevered from the top of boards supplement general lighting from louvred fluorescent fittings designed to minimise brightness contrast. (Philips, Hamburg) ; And with tungsten local fittings (GERMANY) as in the photograph below, where lamps in spun-metal reflectors supplement general lighting from a continuous row of fluorescent fittings around the periphery of the room. Each unit houses three 40-watt fluorescent lamps, with a cover of diffusing glass. Illumination level at the drawing boards is about 600 lux. (Zeis-Ikon, Berlin).

GERMANY Right, reading room in college of further education. Lighting fittings with square diffusing covers are recessed into acoustic ceiling. Each fitting houses four 20-watt fluorescent lamps. (Siemens-Schuckert, Erlangen). DENMARK Below left, small-town school in Espergoerde, near Elsinore. Classrooms have supplementary clerestorey lighting, all windows being fitted with venetian blinds, with artificial lighting comprising two continuous rows of 40-watt fluorescent lamps concealed by plastic diffusers. (Philips, Copenhagen). DENMARK Below right, in a Copenhagen school, again supplementary clerestorey windows, with louvred tungsten fittings housing 200-watt lamps—some suspended from the main ceiling, some recessed into the low ceiling near the windows. (Lyfa, Copenhagen).

SCHOOLS



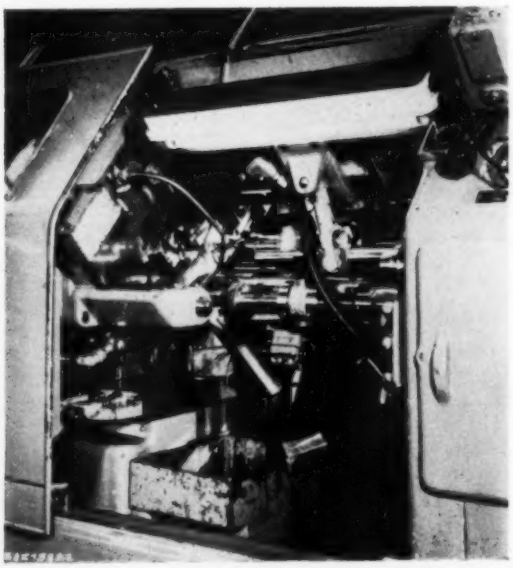




HOLLAND Left, a weaving mill where 40-watt fluorescent lamps are mounted on the ceiling where they are shielded from normal view by the ceiling girders. See illustration at foot of facing page. (Philips, Holland).

INDUSTRY

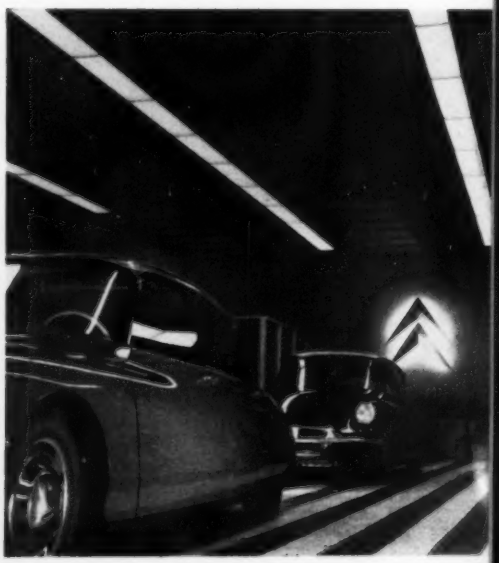
FINLAND Left, recessed multi-lamp fittings housing 80-watt fluorescent lamps. GERMANY Below, local lighting of an automatic machine tool by jet-proof and corrosion-proof fitting of reinforced glass fibre housing a 20-watt fluorescent lamp. (Siemens-Schuckert, Erlangen).



FRANCE Above, vast shop—260m long, 30m wide and 14m high—at the Societe de Galvanisation, Montataire, lit by 200 400-watt colour-corrected mercury lamps. (Philips, France). **GERMANY** Right, factory with north-light roof lit by pairs of fluorescent fittings mounted on the north-light framing to simulate daylight conditions. Each fitting houses a 65-watt lamp. Average illumination level, 250 lux. (AEG, Frankfurt/Main). **HOLLAND** Below, shows effective screening of lamps by ceiling girders in installation also shown at top of facing page.

SHOPS AND SHOWROOMS

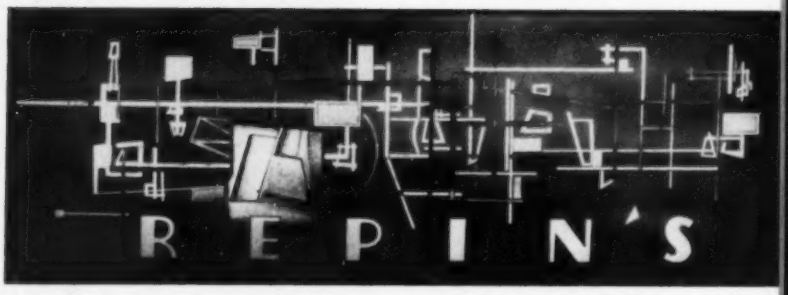
FRANCE Above, Monoprix store, Le Havre. The façade is entirely of glass and the high levels of illumination in the interior (900-1,050 lux) eliminate the need for other windows. Both fluorescent and tungsten lamps are used to provide accurate colour rendering. (Mazda, Paris). NEW ZEALAND Left, men's department in Hays store, Christchurch. Louvred ceiling of coloured aluminium suspended from uneven true ceiling giving illumination level of 26 lm/ft². (Claude Neon). DENMARK Below, Citroen showroom in Copenhagen lit by four rows of surface mounted fittings, each housing the 40-watt fluorescent lamps, with covers of sand-blasted glass. (Lyfa, Copenhagen).



USA Top, automobile showroom, Vermilion, Ohio, lit by pre-assembled luminous ceiling with 2ft square "Styrene" diffusers. (Wakefield, Ohio). GERMANY Centre, shop for ready-made clothes in Munich lit by fluorescent lamps concealed by a luminous ceiling of diffusing plastic. (Siemens-Schuckert, Erlangen). USA Bottom, shoe store with luminous ceiling suspended several feet below level of true ceiling giving high level of illumination (400 lm/ft^2).

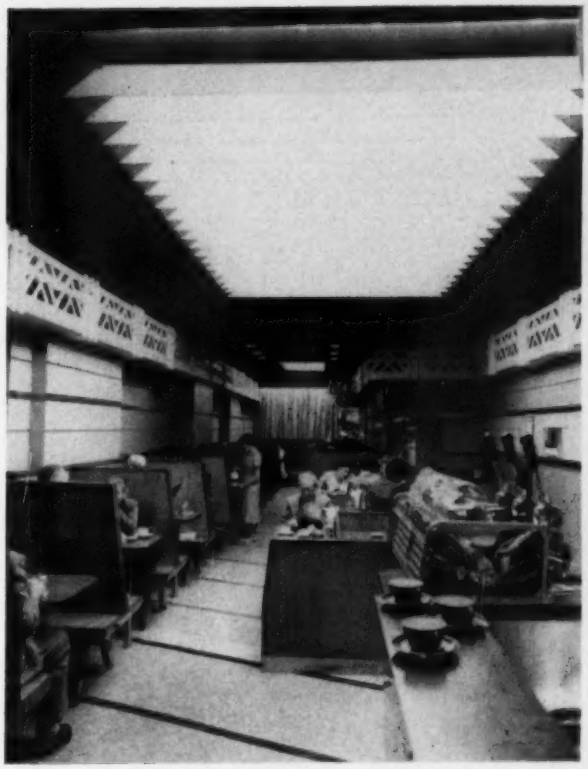
DENMARK Left, cinema at the "Three Falcons" entertainment centre (architect, Ole Hagen). The auditorium is lit by spotlights recessed into the ceiling and by rows of lamps shining through slits in the side walls. (Louis Poulsen & Co., Copenhagen). AUSTRALIA Below, illuminated fascia sign of sand-blasted and multi-coloured glass at Repin's restaurant, Sydney, N.S.W. (Sydney County Council).

MISCELLANEOUS INTERIORS

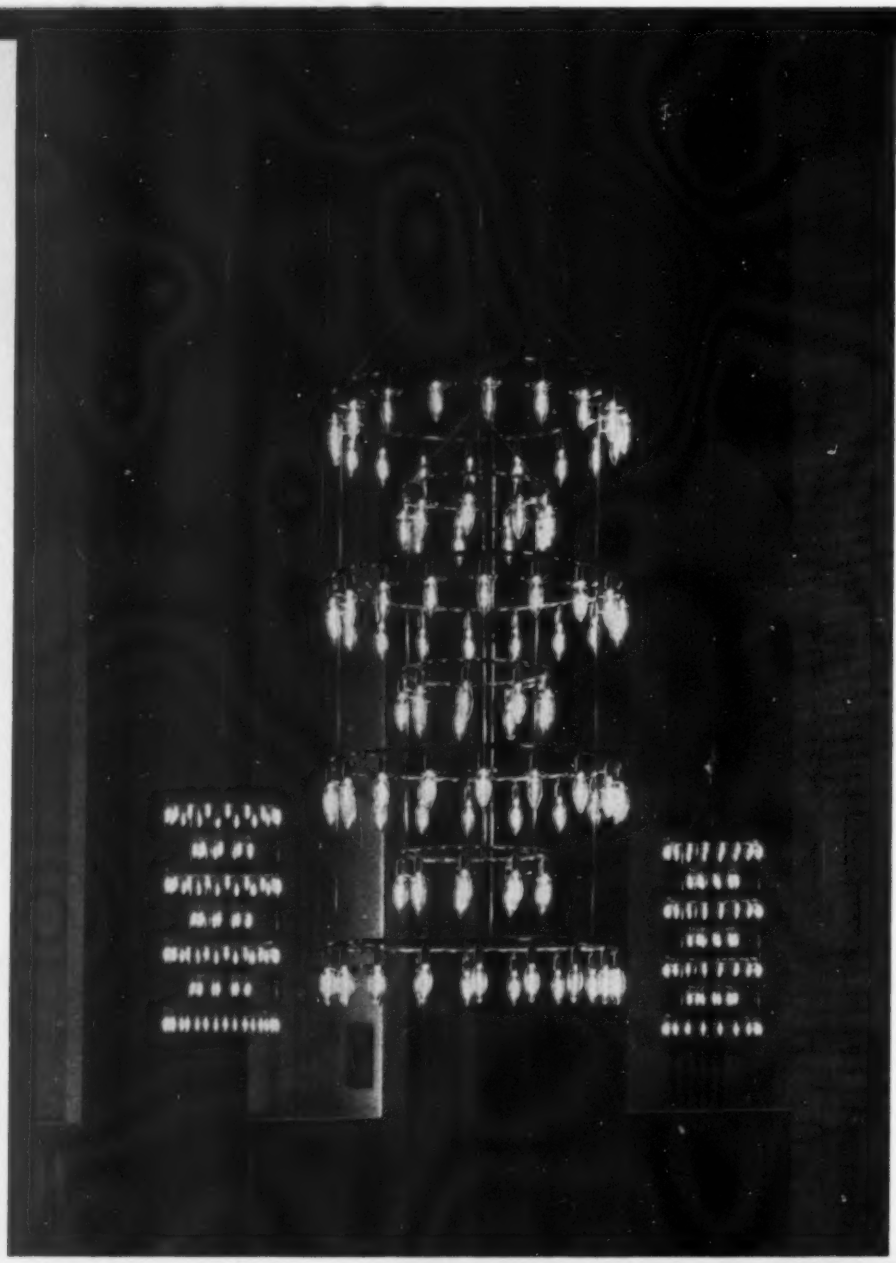


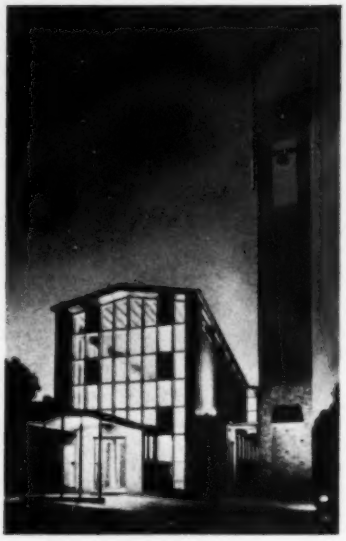
DENMARK Left, Langelinie pavilion restaurant at Copenhagen harbour—on a narrow isthmus between the harbour and the fortress, lit by louvred and decorative tungsten fittings designed by the architect. (Louis Poulsen & Co.)

AUSTRALIA Right, restaurant in Sydney, N.S.W., lit by 40-watt white fluorescent lamps concealed by deep wooden baffles, giving between 30 and 50 lm/ft². (Sydney County Council). AUSTRALIA Below, part of living room/study in house at Dover Heights, N.S.W. The change from study to relaxation use is accomplished by a change in lighting, e.g., from ceiling spotlights to lighting concealed by the pelmet. (Designer, G. Y. Falk).



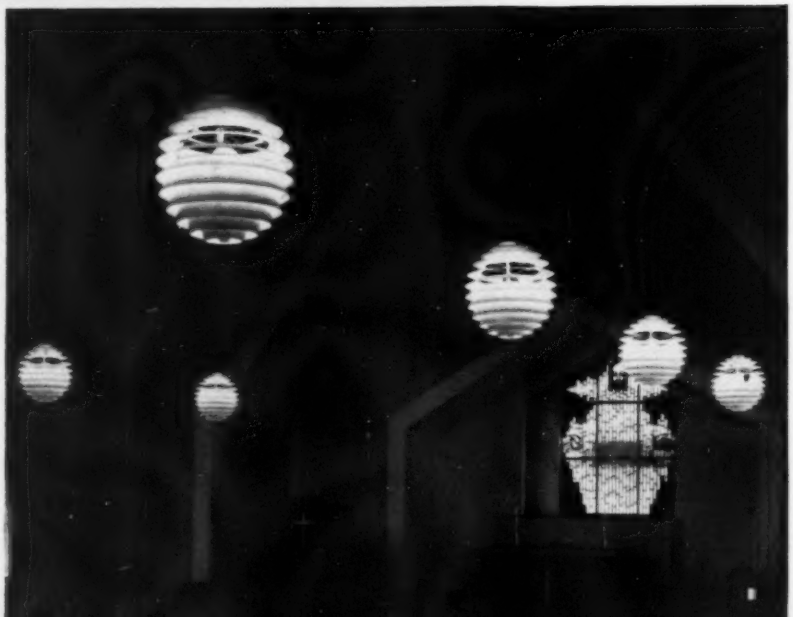
DENMARK Right, Copenhagen restaurant with conical-shaped satin-brass lighting fittings suspended low over the tables. (Lyfa, Copenhagen).



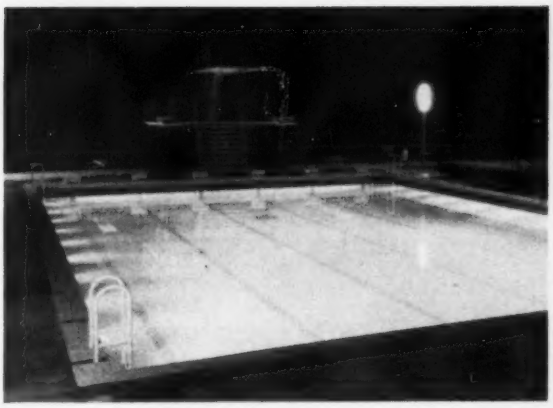


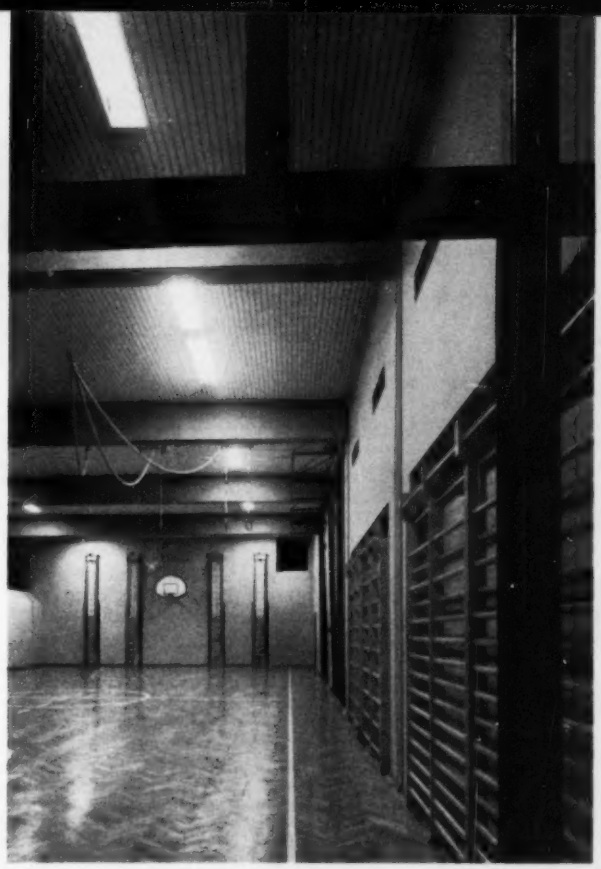
AUSTRALIA Above, night view of west front and entrance of St. George's Church of England, Hamilton South, N.S.W. (architects, N. W. McPherson and D. A. Harrison). DENMARK Left, three of 20 chandeliers of satin brass, each carrying 99 specially made incandescent lamps (110v, 60-watt) connected in series on 220v current to give a colour similar to that of candle light. Designed by architect, Mogens Voltelen. (Fog & Moerup, Copenhagen).

CHURCHES



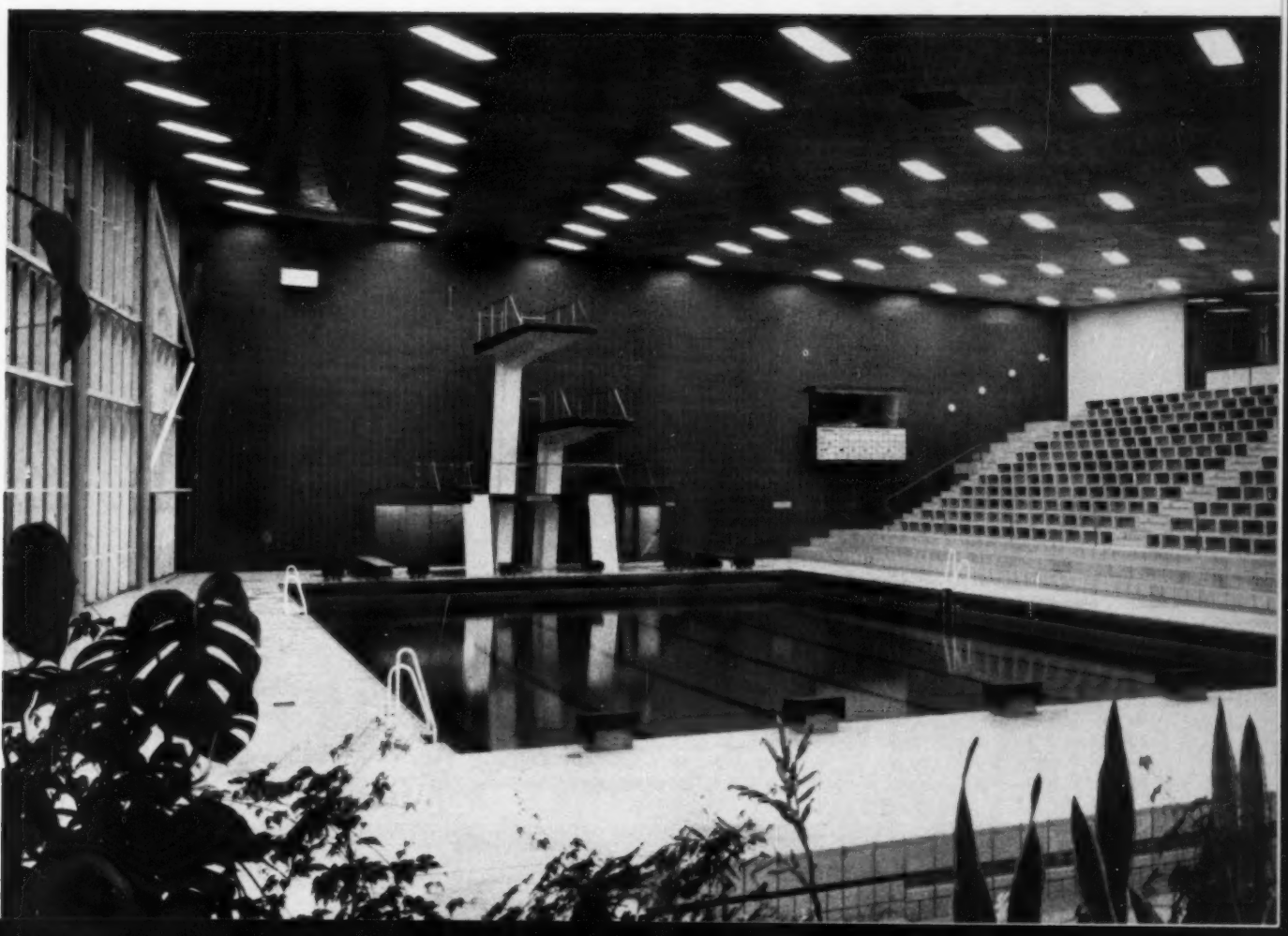
DENMARK Right, church in Skodsborg, north of Copenhagen (architect, Paul Henningsen). The louvred spherical lighting fittings are 60 cm in diameter. (Louis Poulsen & Co, Copenhagen).





SPORT

FRANCE Above, open-air swimming pool at Nantes with underwater lighting from 500-watt lamps at 8 ft. centres. (Mazda, Paris). GERMANY Right, gymnasium lit by 20 recessed fittings each housing three 65-watt fluorescent lamps. Illumination level, 180 lux. (Siemens-Schuckert, Erlangen). GERMANY Below, indoor swimming pool in Essen, lit by fully recessed fittings with plastic covers, each housing two fluorescent lamps. (Siemens-Schuckert, Erlangen).



I.E.S. Golden Jubilee Dinner

Just fifty years ago tonight there was an informal gathering in this building of some twenty-six men of very diverse interests but all united in their desire to found a society devoted to the spread of a knowledge of the principles of good lighting.

L to R, Dr. W. E. Harper, the President, The Mayor of Westminster, the Secretary.

THE above words appear at the beginning of the menu for the Golden Jubilee Commemoration Dinner of The Illuminating Engineering Society which was held at the Criterion Restaurant, London, on February 9th.

The occasion was a most distinguished one with guests representing science, art, industry, the Church, national and local government, the City of London, learned societies and professional institutions and representatives of kindred societies overseas. The guests also included two of the three surviving members who were present at the dinner in 1909—Lord Mount Edgecumbe and Dr. R. Lessing. Prof. J. T. MacGregor-Morris was unable to be present owing to ill-health.

The speeches after the dinner were relayed to the 13 IES Centres and one of the Groups in this country. The first two speeches were also relayed to the South African Centre in Johannesburg. The arrangements for the relay were made with the GPO and it is understood that reception everywhere was of a high standard ; the relay also included a commentary on the proceedings made by Mr. W. R. Stevens.

The Society

The Dean of Westminster (The Very Rev. A. C. Don, K.C.V.O., D.D.), proposing the Toast of "The Illuminating Engineering Society" said: There are many of you here who were not alive when this Society came into existence and therefore you can but dimly imagine what the lighting conditions were in the last decades of the Victorian era. My memory goes back to the 80s of the last century. When I was a boy, I crept into bed by the light of a tallow candle. The house where I lived was lit with oil lamps which, unless very carefully trimmed, emitted nauseous fumes, and even when attended to carefully gave, at their very best, very partial illumination.

Then came the day—I remember it so very well—when gaslight was installed ; first, the flickering naked jet and then what seemed to us in those days a miracle, the incandescent mantle, and then, finally, electric light took the place of gaslight and the era of illuminating engineering dawned upon the world. And what marvels of illumination have been achieved during the past 50 years! Other speakers will tell you what has been done for Art or Science or Industry ; I confine myself to one branch of illumination which is making rapid strides in these post-war days—I mean the art of lighting churches.

The large number of new churches that have been built since the war have provided architects and lighting engineers with the opportunity of demonstrating in a very striking way what can be done in this direction. Our ancient churches present, as you know, a much more complicated and difficult problem. But at least one of our great cathedrals—I refer to the Cathedral of Gloucester—has recently been scientifically relit with the help and with the initiative of one of your own members, and it has been scientifically relit with, I am told, admirable results involving the use of 4½ miles of insulated cable and an expenditure of some £10,000. I must leave it to my successors to see what can be done in this respect in Westminster Abbey. The present lighting is highly unsatisfactory and inartistic with its dazzling pendant lights and its wires suspended from the lofty roof which obscure the newly-revealed beauty of the architecture. Within a few years time the cleaning of the inside stone work of the Abbey will have been completed and then the question of lighting will have to be tackled, and I hope that expert lighting engineers from your Society will be called in to advise how best it can be done.

I will conclude by sending our con-

Above, Mr. H. G. Campbell and The Very Rev. A. C. Don. Below, Sir Charles Wheeler, P.R.A., and Dr. W. J. Wellwood Ferguson.

gratulations and good wishes to members of The Illuminating Engineering Society, wherever they may be assembled this evening, and I invite you who are sitting here tonight to rise and drink to the health of the Society, coupled with the name of your President, Mr. C. C. Smith.

The President (Mr C. C. Smith) responding said: It is, I think, exhilarating and most significant to note that whereas at the inaugural meeting of this Society in this very building some 50 years ago there were 26 present, this evening we have 450 here in person and another 1,500 in spirit. They range from as far afield as our colleagues in the South African centre, gathered at a meeting in Johannesburg, to the north in Scotland. We are all linked physically by GPO line and I think culturally by a common desire to acquire and share knowledge about lighting. It is indeed a great occasion.

Our aims are really twofold and briefly and simply they are: firstly, to bring about a general recognition of the need for good lighting in all walks of life, and secondly, to determine by means of experiment and discussion what the essentials of good lighting really are. In this our Jubilee Year, for the organisation of which we are indebted greatly to Mr. Penny, the Chairman of the Jubilee Committee, and to Mr. Cole, we are concentrating on the first of those two aims, namely, to bring about a general recognition of the need for good lighting in all walks of life. To do this we must endeavour to encourage everybody to co-operate. There must be co-operation between all those concerned with lighting, and there are indeed many—architects, engineers, ophthalmologists, artists, to mention but a few.

If we are to have good lighting installations it is essential that all the people involved get together and state what their specific requirements are in order that the final design may be the best possible. That is all very well, you may say, but how and where can that be done? It can be done at meetings of this Society where all present are able and indeed are encouraged to criticise and offer solutions to the many lighting problems confronting us today when the hours of natural light are hopelessly insufficient for modern requirements. That is where discussion can be most effective.

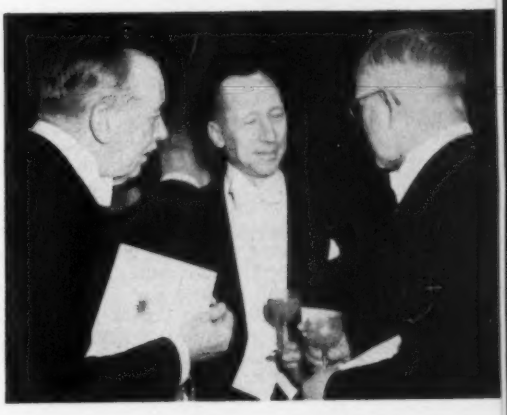
At this juncture I think it would be of value to read the Golden Jubilee Message of congratulations I have received from the Prime Minister. It runs: "I am glad to congratulate The Illuminating Engineering Society on its Golden Jubilee. From the time of its foundation 50 years ago when the familiar form of illumination was the gas mantle or the carbon filament lamp the Society has made a valuable contribution to progress achieved in lighting techniques. I am sure it will continue to do so in the years to come. At the present time when technical progress is proceeding so swiftly it is essential to the nation's well being that the results of research should achieve a quick application. I know it is one of the primary concerns of the Society to ensure that in the field of illumination there is a minimum time lag between an achievement in the laboratory and its practical application. I wish you every success in your important work—(Signed) Harold Macmillan."

And so, Mr. Dean, may I conclude by wishing you personally every health and happiness in your retirement, which I understand is imminent, and also by expressing to you the Society's thanks for a Toast so ably and indeed graciously presented, and to you gentlemen for its generous reception.

Science

Proposing the Toast of "Science" Dr. G. B. B. M. Sutherland, Sc.D., LL.D., F.R.S., said: To have a scientist propose a toast to science is really an anomaly. A toast was part of our heritage in times when superstitious practices were more highly regarded than science as a means of achieving certain objectives. One can visualise the alchemists getting greater power by their use of stones, but hardly the chemists drinking with their test tubes, although I suspect some chemists have tested a very efficient distillation of potions. But however illogical it is for scientists to drink toasts, many of them are engaged in this highly unscientific practice. The number of scientific gatherings annually is now in the thousands, and it is not a good meeting unless there is a good dinner, and it is not a good dinner unless there are some good toasts. But whether the toast should be preceded by a speech is another question. But may I say it is unusual for scientists to drink toasts to science—they usually drink toasts to people. I hope, therefore, you will understand if I start by talking about scientists rather than about science.

Naturally I begin with Sir Isaac Newton who made the first fundamental discovery about the nature of light, namely, that it is literally a mixture of all the colours of the rainbow. It is hardly necessary to ask you to do further honour to Newton—indeed, I am reminded of the story told by Lord Adrian, present Master of Trinity College at Cambridge. Trinity was visited by a scientist who asked to see the rooms where Newton lived. Shocked to find they were occupied by a present Fellow who was not even a scientist, he suggested to the Master that the rooms should have been kept as a museum piece as closely as possible to



Top, Mr. Leslie Gamage, Mons. R. Blancherie (President, Association Française des Eclairagistes), and Mr. J. M. Waldram.

Centre, Mr. A. G. Higgins, Mr. Hugh Pocock, Mr. S. E. Goodall (President, IEE).

Bottom, Mr. J. M. Waldram, Mr. N. Boydell, Mr. L. J. Davies, Prof. P. Schulz (vice-president, Lichttechnische Gesellschaft).

what they were in Newton's day. Lord Adrian's reply was: Considering the college had six portraits of Newton, a statue, two busts and a stained glass window, he thought they had done very well. He added that if Trinity College were to preserve unused rooms occupied by famous men who had been at the college it would be hard to find accommodation for the present Fellows.

It took about 200 years from Newton's time to make any further progress in the understanding of the nature of light. It was not until nearly the end of the 19th century that Clerk Maxwell, Kelvin and Holtzmann and Steven made it clear that light was a form of energy. In the candle and the oil lamp the energy is transformed into luminous energy, but it is impossible to make a candle or a lamp shine more brightly, apart from psychological methods, and that is not easy, and so for many obvious reasons it is much better to convert electrical energy into luminous energy. This problem was first solved satisfactorily by Edison and Swan who introduced the filament lamp. In such a lamp the brightness depends on the temperature to which the filament can be used. This means, of course, it is impossible to simulate sunlight by filament lamp because the temperature of the sun is 5,000 degrees and unfortunately tungsten melts at 3,000 degrees. A more serious objection is that the filament lamp is inefficient because most of its electrical energy is wasted on heat.

The scientific problem of turning night into day is to find a way of converting some cheap and easily available form of energy into luminous energy; it has got to match that coming from the sun without in fact creating a miniature sun. The modern fluorescent and discharge lamps are possibly the first steps in this direction. They are much more efficient than filament lamps but the light coming from them does not yet match sun light. However, there is no reason to believe these problems will not be solved. The exact manner is not yet known, but we know very little about the mechanism with which certain animals produce light. The firefly can produce light very easily when it wants to. Plants are very efficient in converting the energy of sunlight into chemical energy. If we can understand this process, we might be able to reverse it. How nice to have a substance which can be incorporated in tarmac and which will absorb sunlight during the day and show it during the night!

I have talked so far on the function of science in the field of illumination to provide a synthetic sun. It is, of course, very much broader. We do not want daylight everywhere. Artificial lighting has special characteristics which are often preferable. Even scientists prefer to dine by candle light on some occasions! The function of science is to provide an infinite spectrum of light sources which the lighting engineer will have at his disposal to use in the most artistic way. But the designer of a lighting system must be able to specify his requirements, and one of the most important contributions he has made to lighting is to provide standards which are not subjective. This is no easy matter since the final assessment of any lighting system is a subjective one. The scientist is trying to define a standard behaviour, and this is often in the borderland. It requires patience and judgment and discrimination and interpretation of that information. The results of scientific work done in the establishing of standards are not as spectacular as those in the creation of new lamps for old, but they are just as important, and I would ask you tonight to pay tribute to the work of this kind done in national laboratories in this country and abroad. Some of you may have asked yourselves whether a Toast to science is necessary. Are not scientists flourishing these days in such a way as would put any green bay tree to shame? You may be surprised if I say that in my opinion too much reverence is being paid to scientists and in particular to physicists.

When I tell some stranger I am a physicist, there are two immediate reactions. The first is to remark that it would be impossible for us to engage in conversation because the stranger knows absolutely no physics. The second is that I must be connected with either Harwell or Aldermaston, the former establishment being regarded as only slightly less sinister than the latter. This is really a slight reflection on our educational system. While it is important that we produce more scientists, it is more important that every boy and girl should be taught enough science not to regard science with misunderstanding. The old tag "A little learning is a dangerous thing" is not applicable here. It is not a specialised study for a small minority. It should be an integral part of our general intellectual heritage. It only requires stimulation by proper training and I am convinced that anybody capable of passing the 11 plus examination could be taught to appreciate most of the basic concepts underlying science.

I ask you to drink the Toast to "Science" because of the contribution it has made and will continue to make to the purposes of this Society and in the hope that it will become accepted as an essential part of the background of the intellectual citizen.

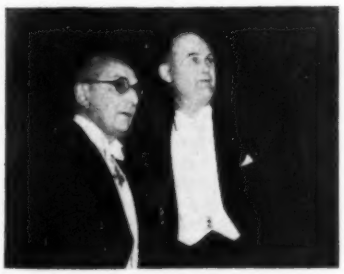
Art

Proposing the Toast of "Art," Sir Charles Wheeler, K.C.V.O., C.B.E., said: Much has been said already this evening about the efficiency of lighting. May I just put in one small word about beauty? Thank you for the efficient lighting which enables me to read my notes, and also thank you,

Dr. J. W. T. Walsh and the Earl of Mount Edgcumbe.

Mr. D. Bellamy (Chairman, British Lighting Council) and Sir Henry Self (Chairman, Electricity Council).

Sir Isaac Hayward (Leader, L.C.C.) and Mr. A. H. Olson.



Above, Dr. F. Lessing and Mr. E. B. Sawyer. Below, the Sheriffs of the City of London and the President.

gentlemen, for putting candles on the table. I have enjoyed looking at them. However advanced you are in science, you will never make a flame more beautiful than that.

I must confess that I, as an artist, was somewhat surprised that I was invited to speak at your Golden Jubilee Dinner, for in these days the emphasis is all on science and technology, and not on the Arts. But I accepted the compliment wholeheartedly, for on reflection I realised it was not so surprising as it at first seemed because you illuminating engineers well know that artists are particularly dependent upon light for the execution of their daily tasks. We may know little or nothing of the mechanics of light, but we do know of its value and meaning in the world of visual reality, which is very much our own domain.

We are told in Genesis that light was the first thing that was created and that the Creator saw the light, that it was good. Therefore, you and we artists are dealing with a thing which is older than anything else whatsoever, and with a thing that is—not in the narrow sense—good. May I humbly offer the artists' congratulations to The Illuminating Engineering Society for its treatment of this most ancient and honourable thing during the past 50 years? You have had many entirely new problems to solve in this century and during your lifetime. You have thrived on them and developed into maturity, to the admiration of us all. To mention a few problems, there is floodlighting, scarcely known 25 years ago. You developed that so that you throw light on buildings and make them look splendid by night. Of course, you cannot make ugly buildings beautiful, or vice versa. For instance, if you stand mid-way on Waterloo Bridge when Somerset House and Festival Hall are both floodlit you will see the latter, which to my eyes is the ugliest building in London, compared with the former which to me—to me, I emphasise—is unsurpassably beautiful. Then there is the lighting of motorways which you have improved and put down too often, unfortunately, at the expense of beauty and in the form—for which you are not responsible—of very ugly concrete lamp standards. When I see the glass houses of modern construction going up—the same, alas, all over the world—I realise that illumination looms larger in present day requirements than ever before. It looks as if it will soon be difficult to keep light out of a building rather than to put it in.

You cannot make a picture without light. Even a bowler hat only becomes one to our eyes when light shines upon it. We artists have three instruments on which to ply—they are colours, forms, and light and shade. Colours are the progeny of light and I think we are not grateful enough for colour. When the Dean, at the beginning of the meal, said grace for meat, I also felt that we sometimes should say grace for light and colour. We are not grateful enough for colour. Think what the world would be without colour! Monochromatic, steely skies, grey fields, black hills, no green grass, no blue vaults above, no brown eyes, no patterned frocks, no anemones, no lilies of the field, no golden glow, no purple splendour. No; I am sure we are not thankful enough for colour, which is the child of light. Then form. Michaelangelo could not have made his perfect sculptures without the play of light on his forms; no Rodin could have made his bronze statues quiver with life without light; Rembrandt, that Dutch master of the chiaroscuro, could not have told us, by applying pigment to a white linen sheet, of the pain, the triumph, the shame, the courage, the whole pathos of the human story, unless he had understood the meaning of light. We are not thankful enough for light. Artists and illuminating engineers have the most marvellous material in their hands, splendidly symbolised by the motif you are using on your Jubilee literature—a sun on the palm of the hand.

May I thank you, as an artist, for inviting me to propose the Toast of the Arts on your 50th anniversary? You will soon be celebrating your Diamond Jubilee. I hope you will invite a few of us to that; and in this fast-moving world you will very soon be celebrating your centenary, but you will excuse some of us if we have a prior engagement.

Industry

Proposing the Toast of "Industry," Mr. Leslie Gamage, M.C., M.A., said: It is my proud duty on this golden evening to give you the Toast of Industry. I do so first and foremost as an optimist, because I have always, both at home and on many visits overseas, trumpeted the wonderful achievements of Britain and British Industry—I have done this for many years past and I am glad to see that at long last it has become quite fashionable. I have, of course, particularly in mind this great lighting industry, with which most of us here are associated. I can say, without exaggeration, that no matter what may be claimed for other British industries, the British lighting industry leads the world—that is just a plain, simple fact.

It is, indeed, most appropriate that the toast to industry should follow on the toasts of Art and Science which we have just heard. There is indeed no industry which owes more to art and science than lighting—it is our partnership with them that has given us that world leadership—but art and science also owe a great deal to industry in general, and the lighting industry in particular. I myself can remember the days when lighting in the home was provided by paraffin lamps and even gas was a novelty. Some of you, too, will remember what a wonderful thing we thought the carbide lamp was for motor cars. Today it is all so much simpler. At the touch of a switch we have as much light as we want and, whatever the job, there is a wide range of equipment for it—the tungsten lamp, the fluorescent tube, the sodium lamp, the high pressure mercury lamp, to mention only a few. And our lighting, besides being much better, costs only a fraction of what it did at the turn of the century.

All this has become so much part and parcel of our daily life that it is only too easy to take it for granted. But such progress does not happen on its own; let us never forget that it was in the research laboratories and factories of industry that the techniques and equipment used today were evolved. If industry had been content to concentrate on producing the hardware of lighting and had not shown such initiative and confidence in research, illuminating engineering as we know it would never have existed. Development work of this kind necessitates a very considerable financial outlay. If industry is to carry out extensive research and development of this nature then industry must be allowed to make the profits which render such things possible. The idea that price is the only criterion, so beloved in some quarters, is a snare and delusion and will defeat its own object.

We in the industry are proud of the benefits we have brought to the home, helping to remove the drudgery of the tired eyes. We are equally proud of the help we have given to all industries—good lighting, like other things, 'adds brightness' as well as promoting more efficient production. We are proud of our airport lighting—we are proud of our road lighting—and we all hope to see these new motor-roads well and truly lighted. We are proud of our flood-lighting, and you will forgive me if I have here particularly in mind the floodlighting of Niagara Falls, a technical feat which represents a new stage in this form of lighting. I am not, of course, mentioning the name of the Company concerned. But how much, in all these fields, yet remains to be done! What opportunities still await this great lighting industry!

The Guests

Proposing the Toast of "The Guests," Dr. J. W. T. Walsh, O.B.E., M.A., D.Sc., said: We are proud to have with us tonight eminent representatives of both national and local government. Although to our great regret we are unable to welcome the Lord Mayor of the City of London, we have the Sheriffs here with us. Perhaps they will

forgive us if our minds go back to those far off days when the City Fathers decreed that every citizen should hang a lantern over his door with a lighted candle therein. I think the decree must have warmed the hearts of the Master of the Tallow Chandlers' Company of that time, whose successor we are glad to welcome with us tonight. How those early members of a lighting authority would have blinked if they could have seen the sort of street lighting which we now enjoy, not only in the City of London but also in the City of Westminster, whose Civic Head we are glad to welcome to our board this evening.

Then we have, too, the Leader of London County Council—I believe, giving no secrets away, this is the last occasion of its kind on which we shall be able to refer to him as "Mr." Hayward. We would like to offer our congratulations on the honour which has been conferred on him by Her Majesty.

Passing from local to national government, we are happy to welcome Sir Edward Muir, of the Ministry of Works, Mr. Proctor, of the Ministry of Power, and Mr. Rodgers, of the Board of Trade which was, incidentally, the government department which in 1930 gave us a coming-of-age birthday present in the form of a Certificate of Incorporation.

What a constellation, what a galaxy of stars we have with us this evening, Mr. President! We know, of course, that one star differeth from another star in glory, but I rather think that tonight our stars differ not so much in the amount of light they emit as in the kind of light they emit. You, Mr. President, have referred to Dr. Don, otherwise I would have been tempted to associate him with that most penetrating of all radiation, the cosmic radiation. Then we have Sir Charles Wheeler as the representative of that Art which peers behind outward seeming and, like the X-rays, goes to the heart of things. We are very glad to have with us representatives of the Royal Institute of British Architects and the Council of Industrial Design.

I am now getting rather near the visible spectrum, but the Society claims that for its own, so just for a moment I would like to turn attention to its neighbours on both sides—the ultra violet on one side and the infra red on the other—and I think the association of those three is a picture of the way in which the illuminating engineer depends on one side on the scientist and technologist, and on the other side on the industrialist. We have indeed been very glad to listen to Dr. Sutherland, who has so eloquently led us in our homage to Science, and with him we welcome the President of the Institution of Gas Engineers and the President of the Institution of Electrical Engineers, the President of the Association of Public Lighting Engineers and the Chairman of the Electricity Council.

As regards industry which, you remember, I compared with the infra red, Mr. Gamage has inspired us with his words and we shall go forward with renewed keenness in our endeavours to bring home the benefits of good lighting to all branches of industry in this country.

Now, if I may pass on to the long wave radiation which we associate with radio communication, we are reminded of the motto of the British Broadcasting Corporation, "Nation shall speak peace unto Nation" and we most cordially welcome here representatives of our sister societies from countries overseas. We have with us Professor Dr. Schulz, of the German Lichttechnische Gesellschaft, M. Blancherie, of the Association Française des Eclairagistes and Mr. Phillips, of The Illuminating Engineering Societies of Australia.

And now let me get back to the visible spectrum, which, as I said, the Society regards as its own special domain. Here we extend a very special welcome to Lord Mount Edgcumbe and Dr. Lessing, because they were two of the 26 far sighted men who, in this building just 50 years ago tonight, founded our Society, and I am sure that its Jubilee must be a great source of pride and satisfaction to them this evening. We welcome, too, some of those whose staunch support throughout the years has contributed in no small measure to the growth and well being of the Society. I would like to refer first to Mr. H. C. Weston, well known to all our members although he is with us tonight in the capacity of the chairman of the Company responsible month by month for issuing the Journal which we all so intimately associate with the life of the Society. With him we are delighted to see representatives of the early sustaining members, and we take this opportunity of expressing our appreciation of their most loyal support over a long period of time.

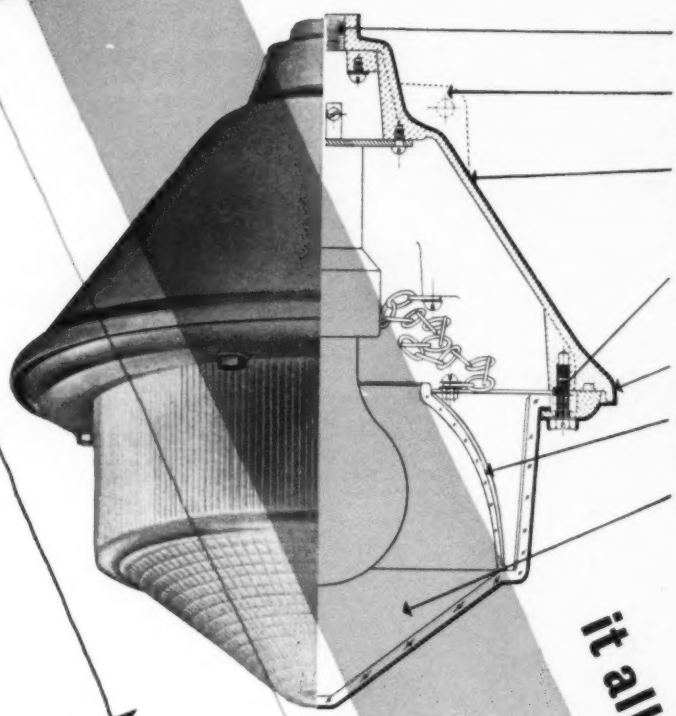
And so, Mr. President and members of The Illuminating Engineering Society, both those of you who are present here this evening and those of you who are gathered together in different local centres up and down the country, I ask you to rise and drink with me the toast of "Our Guests."

The Mayor of the City of Westminster (Councillor David Cobbold, J.P.) responding on behalf of the guests, said: If it is not indecent to use a cricket analogy in this Ash-ridden week may I say I first viewed my position on this Toast List as that of last man in, the player who could not be expected to score at all heavily. Then it appeared to me the five proposers of Toasts must be taken to be the batting side and you, Mr. President, and I must be deemed to be the fast bowlers. I promise not to throw anything, and I will certainly try not to drag.

As I scanned the list of your extremely distinguished guests, two thoughts came to me; first the great variety of their interests and those they represent is a tribute to the wide and growing importance of your Society—Art, Science, Industry, the Church, the City of London, Parliament, indeed everyone in the community is concerned with the technical and technological advances for which you strive. My second thought was the impossibility of any one individual being able to respond to this Toast on behalf of so many leading figures in such diverse fields, until I reflected that tonight your guests have at least one thing in common as men—the ability to enjoy the good food, good drink and good company you have provided for us, for I know I can speak for every one of your guests when I say we have enjoyed your hospitality to the full. As I cannot speak for each of your guests—and I would not dare to try—may I say a few words from the point of view of the City of Westminster? We are honoured to have the headquarters of your Society here and we respect you as our ratepayers. If, as I understand may happen, because you are a scientific society and so become exempt from rates, let me assure you we shall still respect you; and I hope we shall do more than that. As in the past, we shall provide a fertile field in which you may sow the seeds of progress. I say "as in the past" advisedly because in the City of Westminster many of the technical advances of your science have seen their first beginnings. Today, within a quarter mile radius of St. James's we have the greatest intensity of electricity load in the world. We outbid Blackpool there, and even Chicago and New York, because in that small area the intensity is at a rate of 2,000 kilowatts per square mile. Since the war, Westminster City Council has continued its programme of modernising street lighting, and in the next two months we shall do away with high pressure gas lighting and shall have replaced it with electric lighting, mainly fluorescent. We would go in for all fluorescent; it is only in deference to the Royal Fine Arts Commission who, on occasion, seem to think tungsten is preferable. I hope you will excuse the pun if I say we are an enlightened city.

May I at the last moment of this 50 years of your Society join other speakers in congratulating you on your success in the first half hundred and of wishing you greater success for the 50 years to come, and on behalf of all your guests I thank you for a delightful evening.

FOR ALL THE FINER POINTS



ONE Top entry for conduit suspension, ¾ or 1-inch.

TWO Alternative lug fixing for corrosive conditions too severe for conduit.

THREE Lightweight silicon-aluminium die-casting, highly resistant to corrosion. Special finishes for extreme arduous service also available.

FOUR Sealed to prevent ingress of dust, moisture, etc., thus high lighting efficiency is prolonged with reduced maintenance costs.

FIVE Watershed lip for exterior use, or hosing down.

SIX Interior prismatic reflector redirects upward light from lamp down through conical base of

SEVEN Outer diffusing bowl of durable prismatic glass, set in a plastic compound in detachable ring.

ILLUMINATING ENGINEERING SOCIETY 1909/1959

it all points to

Holophane's Reflector-Bowl Cast Pendant illustrated is specifically designed for service in dirty and severely corrosive conditions, and is installed in the largest chemical and gas works in the country, and many other situations requiring a vapourproof, dustproof, weatherproof fitting. Pressurised and pressure-purged versions with alternative top and side-through entries are available. This unit combines all the finer points of engineering and optical skill applied to scientific illumination by Holophane over the past 60 years. Reflector-Bowl Cast Pendants, described in *Catalogue 5600* also details many other industrial fittings, free on request.

HOLOPHANE

SCIENTIFICALLY CONTROLLED LIGHTING

HOLOPHANE LIMITED · ELVERTON STREET · WESTMINSTER · LONDON, S.W.1 · Telephone: VICtoria 8062

Book Review

"Light, Colour and Vision" by Yves le Grand. Published in English translation by Chapman and Hall (London 1957). xiv + 512 pp. with 125 line diagrams and 48 tables in the text, and exercises and their solutions with each chapter. Price 63s.

During the past ten years or so Professor le Grand has recorded in three text books the substance of the course of lectures on Physiological Optics which he has given at the Institut d'Optique in Paris. In these three books he discusses in some detail and with great authority the properties of the human eye; firstly as an optical instrument (the most useful and the least expensive of all), secondly as a receiver of light (one of the most sensitive there is) and thirdly as the means of our perception of the whole universe around us in terms of form, colour and movement.

It is the second of these three volumes, originally published in 1948, which has been translated into English; an excellent translation done by Dr. J. W. T. Walsh, Col. F. R. W. Hunt and Dr. R. W. G. Hunt, in which the logical and precise thought of the original French text has been rendered into fluent English. The two principal sections deal with the experimental facts of the perception of light, colour and detail and with the theories of vision, explaining the usual processes as we understand them at present.

As a text book for students, this book is as comprehensive and clear as any of its date; there are few references later than 1952, but the text is written with knowledge of more recent work. As a work of reference it is limited in the same way, giving details of much of the well-established work with admirable clarity but referring to post-1950 work in outline only. The approach is understandably academic, explaining the fundamental properties of light and of the eye and the basic theories of vision rather than the every-day problems which confront the practising lighting engineer. As an example which is perhaps a little unfair to the author, the names of Weston, Hopkinson, Calvert and Winch do not appear in the bibliography, and problems such as the optimum amount of light for a given task, the effects of glare and movement or the colour effects of modern light sources are not fully discussed. These subjects may be more appropriate to the third volume in the series, which we may see later, but one expects to find rather more complete information on them under the title of this book.

Within these limitations, there is nothing but praise for the contents and for their orderly arrangement. If this reviewer has taken longer than he should to prepare these notes, it is because the book is so encyclopaedic and authoritative that it could not be appreciated by perfunctory reading. It may be hoped that this late review will reach some who missed earlier notices, or remind some others that this book should be ready at hand on the shelves of anyone seriously interested in the process of seeing.

J. G. H.

Situations

Vacant

Ekco-Ensign Ltd. require experienced LIGHTING ENGINEERS at their Birmingham and London offices. They should have completed National Service and be conversant with modern lighting planning and equipment. Apply Senior Lighting Engineer, 45, Essex Street, Strand, W.C.2.

Work for an independent LIGHTING CONSULTANT in ideal conditions in Hertfordshire. Lighting engineering experience essential. Rapidly expanding practice includes design of installations and fittings, integration of lighting with building techniques and data collection and analysis. Apply stating age and salary required to Derek Phillips, ARIBA, No. 1, Bovingdon Green, Nr. Hemel Hempstead, Herts.

LIGHTING SALES ENGINEER. Experienced man having proven sales record and strong connections with users, architects and consultants required by Holophane in Manchester and North-West area. Short period of training will be given at head office in London and successful candidate will be expected to apply specialised Holophane techniques in illuminating engineering with energy and enthusiasm in his territory. An opportunity for a youngish man to build his future in a happy old-established organisation. Car provided and expenses. Contributory Pension Fund. Apply with full details of experience, etc. (marking envelope "Confidential") to Sales Director, Holophane Ltd., Elverton Street, Westminster, London, S.W.1.

FORTHCOMING EVENTS

LONDON

April 21st

Discussion. "Independent Lighting Specialists—Are they desirable in the interests of the client?" To be opened by J. S. McCulloch (consulting engineer), C. J. Veness (electrical contractor), W. Boissevain (fittings manufacturer) and Kenneth Bayes (architect). (At the Federation of British Industries, 21, Tothill Street, London, S.W.1.) 6 p.m.

May 12th

Annual General Meeting. 5.15 p.m. Lecture, "Light and Pattern in Painting," by Sir Philip Hendy. 6.30 p.m. (At the National Gallery, Trafalgar Square, S.W.1.)

CENTRES AND GROUPS

April 1st

EDINBURGH.—Annual General Meeting. (At Y.M.C.A., 14, South St. Andrew Street, Edinburgh.)

April 6th

LEEDS.—Annual General Meeting. (At the Guildford Hotel.)

April 9th

MANCHESTER.—Annual General Meeting—"Son et Lumière in Great Britain," by H. Hewitt. (At the Green Room Theatre, Cheapside, off Cross Street, Manchester 2.) 6 p.m.

April 13th

SHEFFIELD.—Annual General Meeting. Technical Film Evening. (At the Grand Hotel, Sheffield.) 6.30 p.m.

April 14th

LIVERPOOL.—Civic Reception at the Town Hall.

April 20th

BATH and BRISTOL.—Annual General Meeting. (At Gardner, Sons and Co. Ltd. Showroom, Broad Plain, Bristol.) 7 p.m.

April 21st

GLOUCESTER and CHELTENHAM.—Annual General Meeting. (At the Fleece Hotel, Cheltenham.)

LIVERPOOL.—Annual General Meeting. Film Show. (At the Merseyside and N. Wales Electricity Board Industrial Development Centre.) 6 p.m.

April 22nd

LEICESTER.—Annual General Meeting. (At the Bell Hotel.)

April 24th

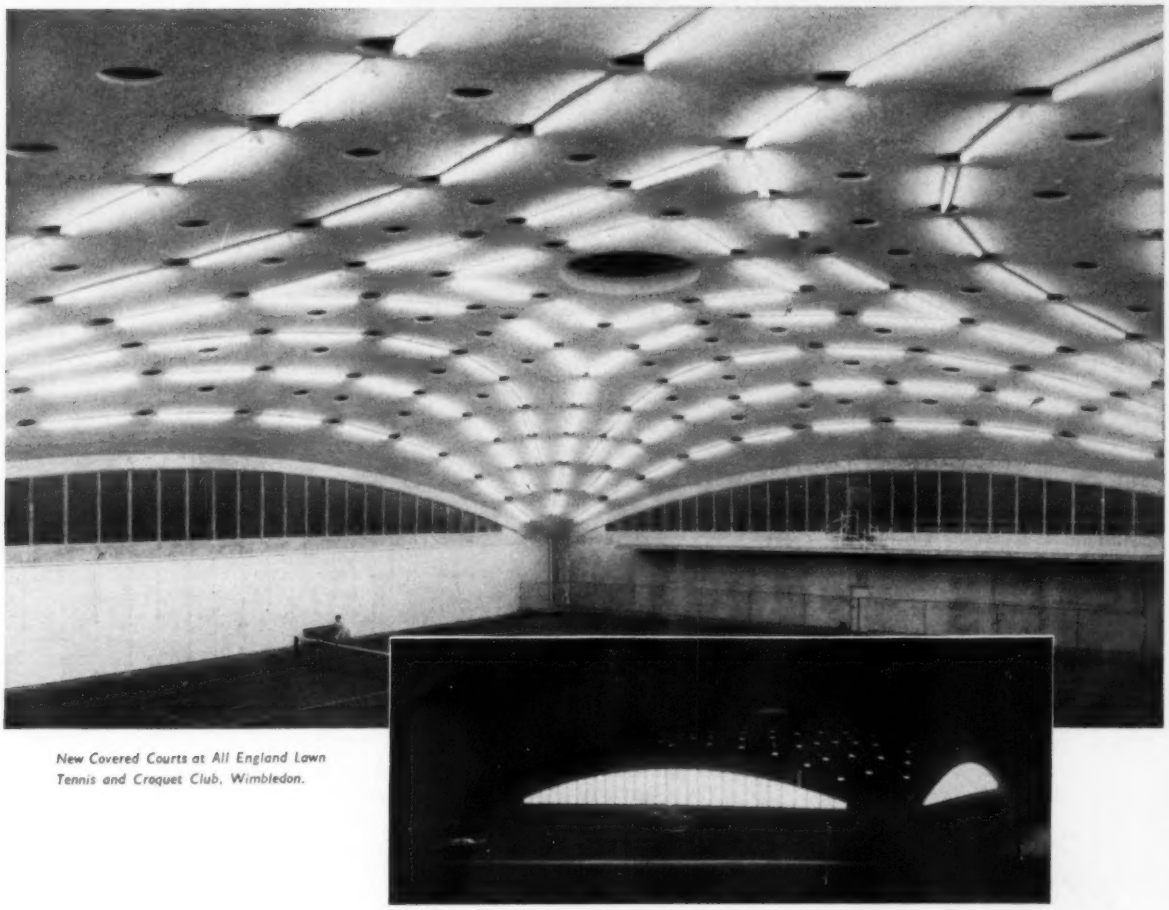
BIRMINGHAM.—"Lighting and Industry in the Soviet Union," by E. H. Norgrove. (At Regent House, St. Phillips' Place, Colmore Row, Birmingham.) 6 p.m.

April 24th-26th

Joint Regional Conference of the Leeds, Newcastle and Sheffield Centres at York.

PHILIPS

Free Lighting Design Service...



New Covered Courts at All England Lawn Tennis and Croquet Club, Wimbledon.

helps to build for the future

The Philips Lighting Design Service offers comprehensive expert advice from a team of experienced lighting engineers and a qualified architect who has made a special study of light in relation to colour – all this, *without charge or obligation*. The service has, since its inception, been responsible for many of the most imaginative lighting schemes devised in recent years. You can avail yourself of it simply by asking your electrical contractor or getting in touch with Philips direct.

PHILIPS ELECTRICAL LTD *LIGHTING DIVISION*

CENTURY HOUSE · SHAFTESBURY AVENUE · LONDON · W.C.2
(LD3129)

The Solar Compensating Dial displayed in the illustration is a Horstmann invention. Once set, it will continue automatically to reproduce the correct lighting and extinguishing schedule for the region in which it is installed.

The accuracy and reliability you demand are revealed in

the Anatomy of a Horstmann Time Switch

This is the Horstmann Type K Mark II plug-in pattern Time Switch, with synchronous motor driven movement of 20 amps capacity at 200/250 volts, 50 cycles. Models to meet other requirements can be supplied to order.

To meet many different needs, Horstmanns make a large range of Time Switches, but two major requirements are common to all. Time Switches must be *accurate* and they must be *reliable*—able to operate unfailingly under varying conditions of service with scarcely any attention. Horstmanns build these essential qualities into their instruments by employing high grade materials, skilled precision craftsmanship and—half the secret—over 50 years of experience in design and manufacture.

Horstmann Time Switches are used extensively for the control of street lighting, shop window lighting, electric signs, special tariff control—in fact wherever electric current needs to be controlled without human intervention. Such superior instruments compare favourably in price with other time switches but quality has not been sacrificed for cheapness. The best Time Switches are the cheapest in the long run, and Horstmann Time Switches run for a *very* long time.

Full details about all models sent on request.

HORSTMANN TIME SWITCHES FOR CONTROLLING THINGS ELECTRICAL

HORSTMANN

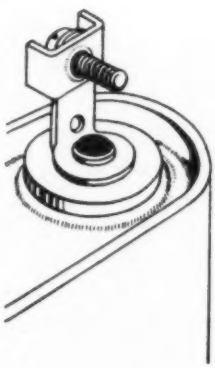
THE HORSTMANN GEAR CO LTD. BATH SOMERSET

Hunts THERMINOL CAPACITORS FOR FLUORESCENT LIGHTING

A new range of foil and paper capacitors to meet the exacting requirements of the Fluorescent Lighting Industry, Hunts Therminol Capacitors incorporate the following important features :—

- **Impregnated and filled with a specially developed non-inflammable oil.**
- **Safe and entirely reliable operation in ambient temperatures of up to 70°C.**
- **Housed in oval shaped extruded aluminium cans.**
- **Seam-welded lids which form no exterior ridge, giving increased operating efficiency with reduced dimensions.**
- **If required, a screw and "U" clamp can be fitted at extra cost. (See diagram).**

★ *As streamlined as the tube itself.*



SPECIFICATION

Test Voltage :
Capacitors. Up to and including 250 volts A.C. = Wkg volts x 2
above 250 volts A.C. = Wkg volts x 2.5
D.C. Test = A.C. Wkg volts x 3
To Earth, A.C. wkg volts + 1,000 volts A.C. or 2,000 volts A.C. min
Sealing Test : Each Capacitor is heat tested at 80°C
Capacitance Tolerance : Standard limits as shown. Others by arrangement
Power Factor : Better than 0.3% at working volts at 30°C

TYPE L89/1 STANDARD RANGE

Capacitance μF	Volts A.C. wkg.	List No.	Dimensions—inches	
			Length	Cross section of all units
3.2 min	250	ZG101	2	2.148 x 1.398
4 min	250	ZG102	2¼	
5 min	250	ZG103	2⅜	
6 min	250	ZG104	3	
7.4 min	250	ZG105	3½	
3.5 ± 5%	400	ZG106	3¼	
6.8 ± 5%	400	ZG107	5⅛	

REGISTERED TRADE HUNTS MARK CAPACITORS

MAKERS OF FIXED CAPACITORS for all RADIO, ELECTRONIC and ELECTRICAL POWER USES, DRY ELECTROLYTIC — METALLISED PAPER — FOIL and PAPER — SILVERED MICA — STACKED MICA — CERAMIC — TRANSMITTING TYPES, etc., etc.

A. H. HUNT (Capacitors) Ltd., Electrical Division, Vulcan Way, New Addington, Croydon, Surrey. Telephone: Lodge Hill 2661-4.
Head Office: Bendon Valley, Garratt Lane, Wandsworth, London, S.W.18
Factories also in Essex and North Wales

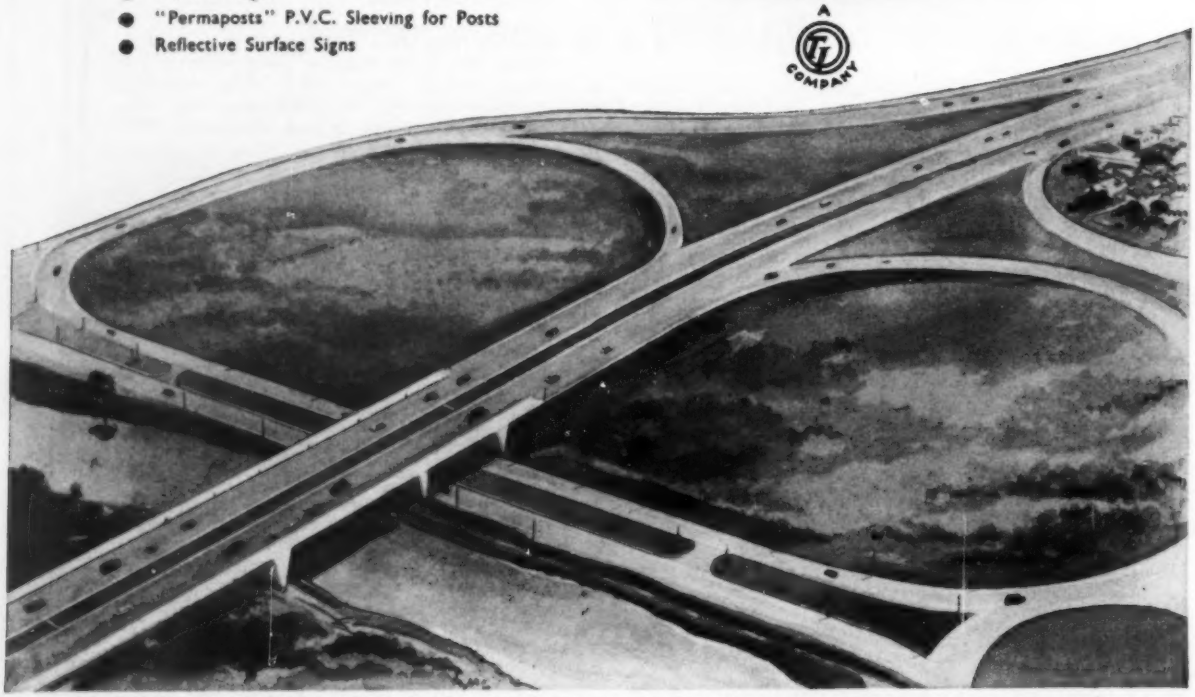
The largest and most
experienced designers
and manufacturers of

ROAD SIGNS and EQUIPMENT

- Road Traffic Signs, all finishes
- Illuminated Guardposts
- Tubular Steel Posts/Columns
- Lighting Columns
- Direction Arms
- Approach and Route Direction Signs
- Street Nameplates
- Beacon Globes, Plastic
- Steel Road Studs, Lines and Letters
- Letters and Arrows — Plain or Reflex
- Cast Iron Island Sites
- External Lighting Fittings
- Portable Signs
- "Permaposts" P.V.C. Sleeving for Posts
- Reflective Surface Signs

GOWSHALL LIMITED

A TI COMPANY



Head Office & Works: ROOD END ROAD, OLDBURY, BIRMINGHAM. *Phone:* BROadwell 2291-2
London Office & Showrooms: LAMBS CONDUIT PASSAGE, RED LION SQUARE, LONDON, W.C.1. *Phone:* CHAncery 7042 & 7845

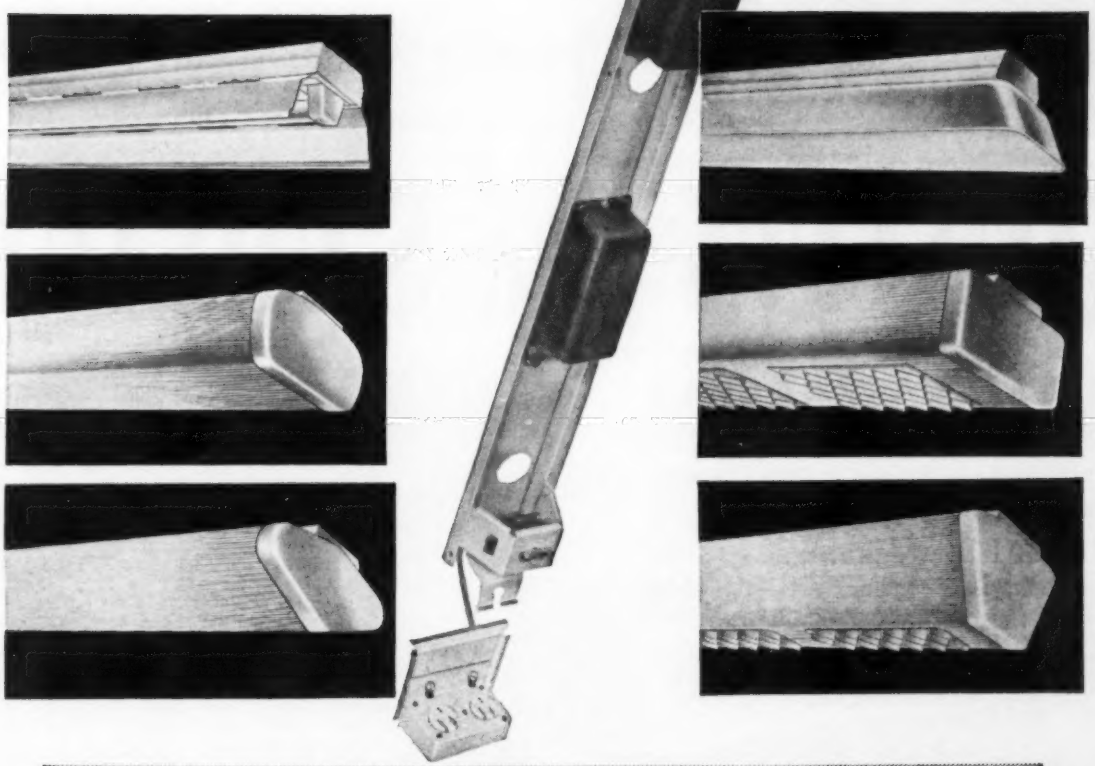
EKCO

Essex Range

PATENT APPLIED FOR

FLUORESCENT FITTINGS

Over 200 Fluorescent Fittings from one basic spine



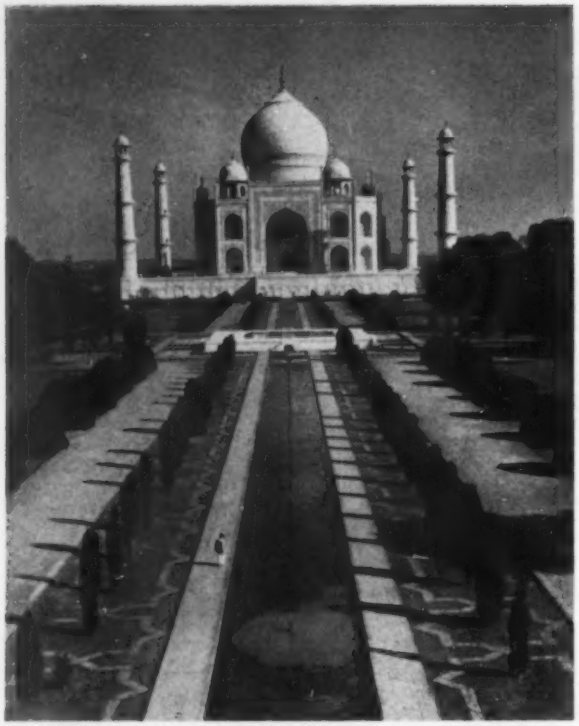
* *Installation and maintenance costs drastically reduced*
* *Easy assembly by one man*
* *Full range of quick-fix metal and plastic reflectors with open or closed ends*
* *Modern styled diffusers with coloured endplates—quickly detachable for ease of maintenance*

EKCO-ENSIGN ELECTRIC LTD., 45 ESSEX STREET, STRAND, LONDON, W.C.2. TEL: CITY 8951

SALES OFFICES, ILLUMINATING ENGINEERING DEPTS., SHOWROOMS AND DEPOTS IN

LONDON · MANCHESTER · BIRMINGHAM · NOTTINGHAM · GLASGOW · CARDIFF

EL 66A



Quality in Architecture, Taj Mahal India (Courtesy of Information Service of India)

CRYSELCO

lamps and fittings can be obtained from any of fourteen branches and depots throughout the country.

All CRYSELCO business is based upon a policy of Quality and Service.

This attention to detail in production and distribution, coupled with more than 60 years' experience in lamp manufacture, ensures quality products, promptly delivered.

The range of lamps and fittings available is extensive. If you have not received the current catalogue, please send for one today.

QUALITY and SERVICE

CRYSELCO BRANCHES

are situated throughout the country.

Their aim is to give you quality products plus good service.

CRYSELCO Managers in the following towns and cities would be pleased to hear from you.

BEDFORD
BIRMINGHAM
BRISTOL
BURY ST EDMUNDS
CARDIFF
GLASGOW
LEEDS
LEICESTER
LIVERPOOL
LONDON
MANCHESTER
NEWCASTLE
NOTTINGHAM
SOUTHAMPTON

CRYSELCO LIMITED

KEMPSTON WORKS **BEDFORD**

Service by Rickshaw in Durban, South Africa (Photo by J. Allan Cash)

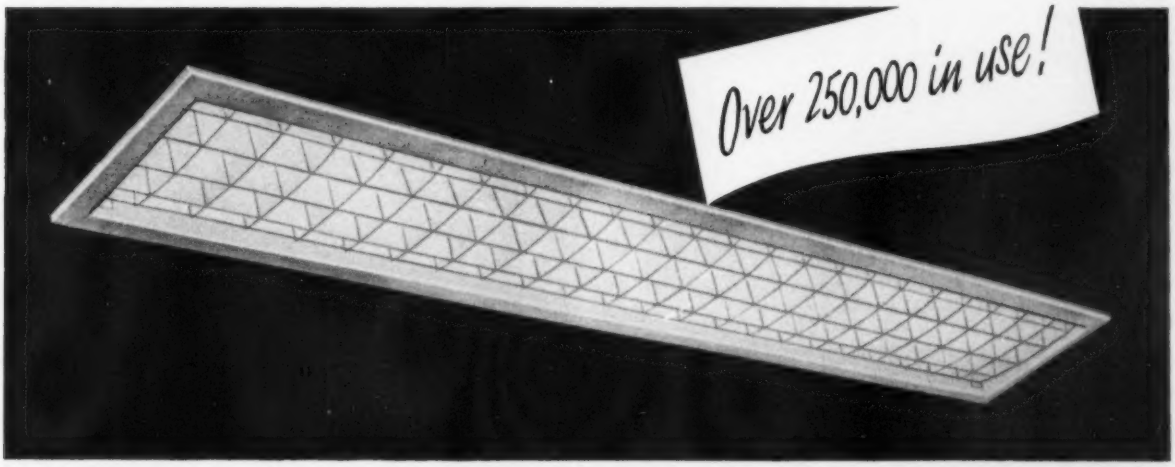
Crompton RECESSED FITTINGS

Now, to the clean-lined modern look of recessed fluorescent fittings, add the advantages of Crompton 'New-Range' standardised parts.

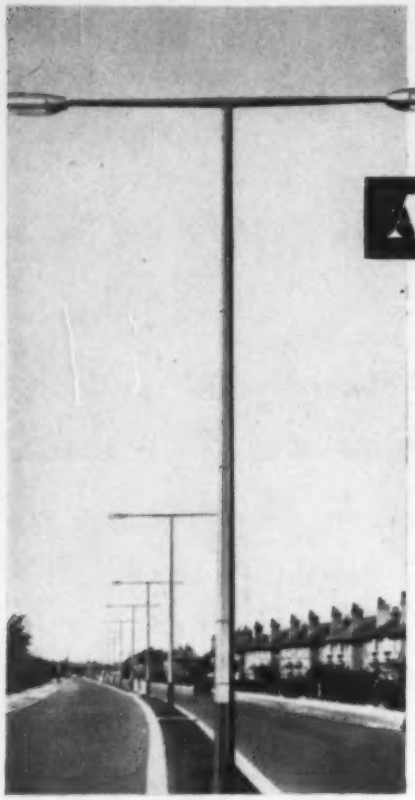
Smart flush-mounting frames accept either shallow opal dishes, diffusing light generally; louvres, limiting the spread of light; or open frames, allowing normal cut-off with, if necessary, quick adaptation to diffusers or louvres.

Simple fixings to usual structures; maintenance easily carried out from below.
Ask for full details from your nearest Crompton Parkinson branch office.

Crompton 'NEW-RANGE' FLUORESCENT FITTINGS



CROMPTON PARKINSON LIMITED CROMPTON HOUSE, ALDWYCH, LONDON W.C.2.



secure your lighting with

ADASTRA STEEL COLUMNS

ECONOMY IN ERECTION · EASE IN TRANSPORTATION
GALVANISED FOR DURABILITY

No matter what the setting, ancient or modern, city or suburban, torrid or tropical, "Adastra" columns will unobtrusively merge into any scheme, robustly enduring the rigours of all climates.
An extensive range of many graceful designs is available to serve street lighting demands. The aesthetic qualities are confirmed by the approval of the Council of Industrial Design.

Positive protection is ensured by the basic finish of hot dip galvanising. This provides a heavy coating of pure zinc on all surfaces both inside and outside. Columns can be finally painted in colours to accord with individual requirements.
Lightness in weight with compactness in storage are additional features which enhance a column ideally suited for all needs.

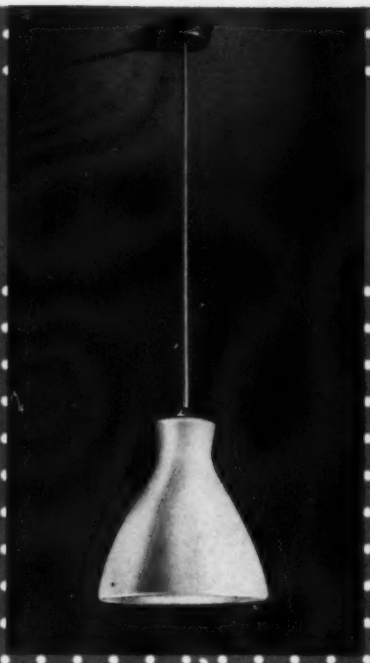
POLES LTD.
CONSTRUCTORS GROUP

TYBURN ROAD, ERDINGTON, BIRMINGHAM 24.
Telephone: ERDington 1616
London Office: 98 Park Lane, W.1.
Telephone: MAYfair 3074

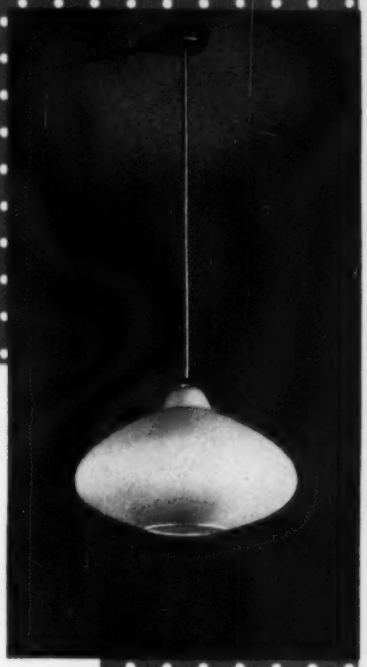
INDEX TO ADVERTISERS

	Page
A.E.I. Lamp and Lighting Co. Ltd.	cover ii
Atlas Lighting Ltd.	xiii
Benjamin Electric Ltd.	vi
British Lighting Council	cover i
Cayson Electrics Ltd.	xi
C. M. Churchouse Ltd.	xv
Crompton Parkinson Ltd.	xxiii
Cryselco Ltd.	xxii
Ekco-Ensign Electric Ltd.	xxi
General Electric Co. Ltd.	ix
Gowshall Ltd.	xx
Hailwood and Ackroyd Ltd.	cover iii
Harris and Sheldon Ltd.	iii
Hiscock Appleby and Co. Ltd.	xv
Holophane Ltd.	147
Horstmann Gear Co. Ltd.	xviii
A. H. Hunt (Capacitors) Ltd.	xix
Imperial Chemical Industries Ltd. (Plastics Division)	cover iv
Lumalampan AB	ii
Lumenated Ceilings Ltd.	xvi
Major Equipment Co. Ltd.	xv
Merchant Adventurers Ltd.	xii
Philips Electrical Ltd.	xvii
Poles Ltd.	xxiv
C. Quitman Ltd.	xiv
Revo Electric Ltd.	iv, v
S.L.R. Electric Ltd.	xi
Stanton Ironworks Co. Ltd.	x
Styrene Products Ltd.	vii
Tube Lamination and Engineering Co. Ltd.	viii
Venner Ltd.	i

Published by THE ILLUMINATING ENGINEERING PUBLISHING COMPANY LIMITED, at 32 Victoria Street, London, S.W.1. Printed by KNAPP, DREWETT AND SONS LTD. 30, Victoria Street, London, S.W.1, England.

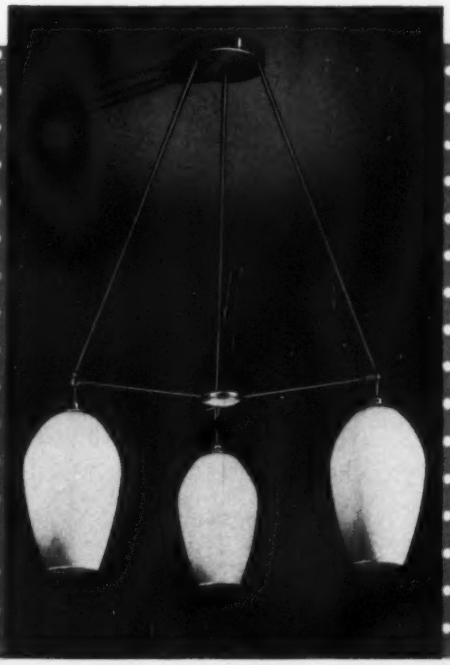


These illustrations are typical of many variations possible with the Satina range of contemporary fittings. Shades are available in white satin opal and soft satin pink.



"Hailware"

TUNGSTEN LIGHTING FITTINGS

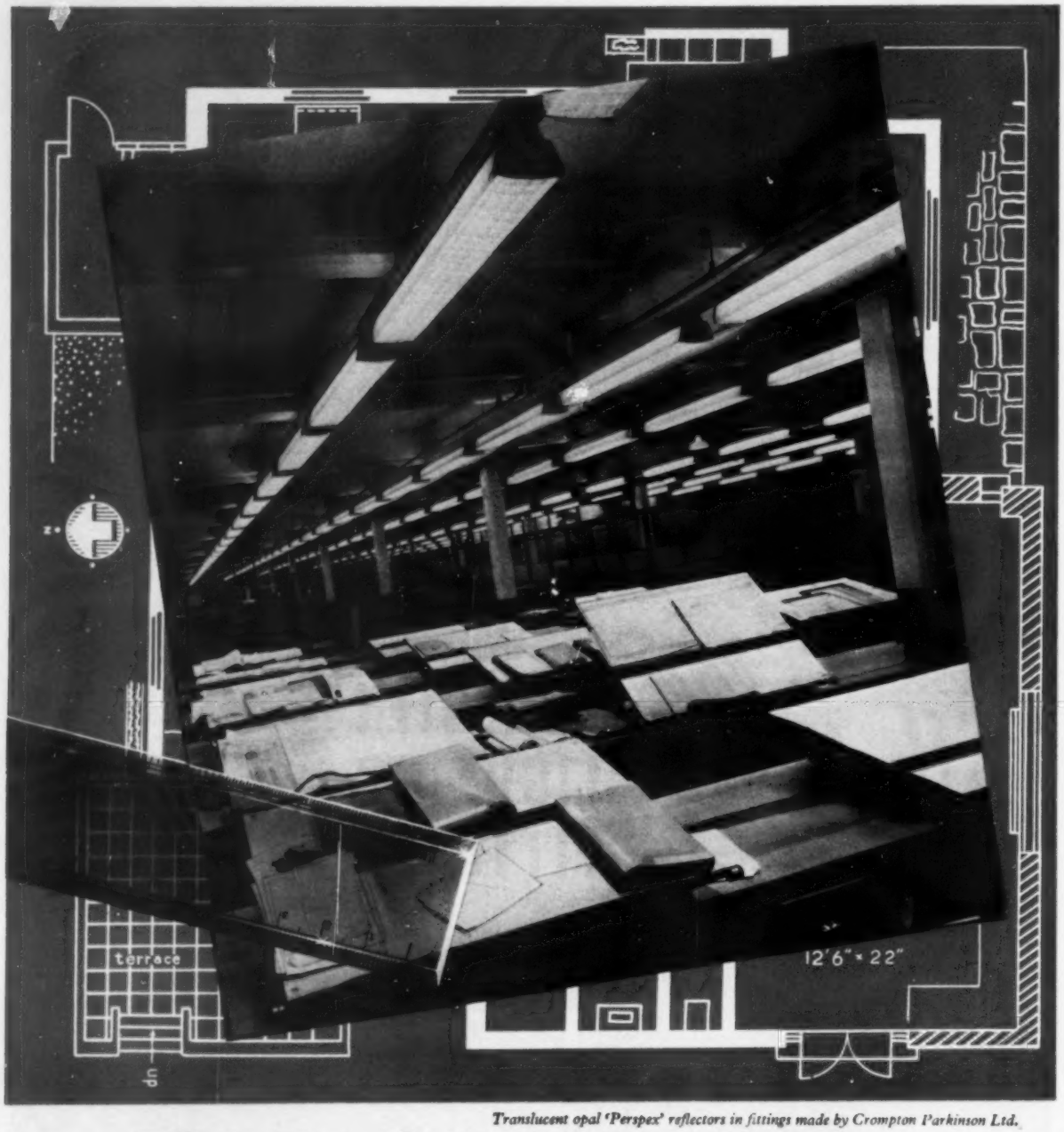


HAILWOOD & ACKROYD

LIMITED

18 LOWNDES ST., LONDON, S.W.1

Telephone: Sloane 0471-2



Translucent opal 'Perspex' reflectors in fittings made by Crompton Parkinson Ltd.

Efficient and comfortable lighting with translucent opal 'Perspex' reflectors

BY CHOOSING 'PERSPEX' acrylic sheet from many other materials for their lighting fittings, Crompton Parkinson Ltd., ensure for their equipment:- Freedom from discolouration • toughness and durability • light weight • resistance to atmospheric corrosion • ease of cleaning • superb appearance • ease of heat shaping • choice of a wide range of attractive and efficient materials in transparent, translucent and opaque grades.

'PERSPEX'

'Perspex' is the registered trade mark for the acrylic sheet manufactured by I.C.I.

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON · S.W.1

ICI